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George Washington University

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AN EVALUATION OF THE MINOR SERVICE
PROBLEMS OF PUBLIC WORKS CENTERS

CHARLES E. DIEHL

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AN EVALUATION OF THE MINOR SERVICE
PROBLEMS OF PUBLIC WORKS CENTERS

by

Charles E. Diehl

B. Arch. E., 1948, The Catholic University of America
B.C.E., 1952, Rensselaer Polytechnic Institute

A thesis submitted to the Faculty of the School of
Government, Business, and International Affairs of The George
Washington University in partial satisfaction of the require-
ments for the degree of Master of Business Administration.

June 7, 1961

Thesis directed by

Arlin Rex Johnson, Ph.D.,
Professor of Business Administration

DIEHL, C.

PREFACE

Prior to reporting for instruction in Comptrollership at George Washington University, the writer was assigned to duty within a naval base complex. Although the particular naval base included a public works center, the larger commands continued to provide most of their own public works support, rather than to rely on the existing public works center. The first innocent attempt by the writer to "give business" to the Public Works Center was a failure. After this eye opener, it was noted that the general opinion was to the effect that public works centers were not responsive in providing service, and secondly that the charges for services were exorbitant. The reply in defense of the public works centers was to the effect that they were founded on recognized principles of management, with the added inference that if the customers were unhappy, it was mainly because the customers were unreasonable in their requests.

The writer is not willing to accept the hypothesis that public works centers are unsound; but past experience with Navy, Marine, and Air Force commands has not provided any basis that would enable the writer to consider that the majority of customer activities, or commanding officers, are unreasonable

in their service requests. Piqued by this apparent dilemma, the writer determined to study the functioning of public works centers. The original scope of this thesis included an overall study of public works centers. It soon became apparent that this subject was much too large, and it was decided to concentrate on the area of the minor service functions. The area of the minor service functions has only been touched upon. The greater part of this thesis deals with laying the ground for an organizational study. One of the main purposes of the thesis was to determine if there was a common ground of understanding as to the definition of reasonable service between the customer and the Civil Engineer Corps manager. If a common ground was found, then it would be possible to erase the picture of the "unreasonable" customer and study the management organization. Because of the magnitude of preparing, mailing and evaluating a rather extensive field survey, little time remained to study the minor service functions, and therefore the subject is discussed only to point to certain modern management techniques that may be of value.

Appreciation for their kind consideration in providing information and assistance is due to Dr. A. Rex Johnson and Miss Helen McNulta of the staff of George Washington University; the "A" Group of the Bureau of Yards and Docks, and the many CEC officers and activity Commanding officers who so graciously

In some cases, however, the results of the experiments are not
 as clear as they should be. This is due to the fact that the
 results of the experiments are often affected by the conditions
 under which they are carried out. It is therefore necessary to
 take care to control the conditions of the experiments as far as
 possible. This can be done by using the same apparatus and
 materials in all the experiments, and by carrying out the
 experiments in the same order. It is also necessary to repeat
 the experiments several times in order to obtain a reliable
 result. The results of the experiments should be recorded in a
 table, and the table should be examined carefully to see if
 there is any regularity in the results. If there is, this
 may be due to the conditions of the experiments, or it may
 be due to the nature of the substances being experimented
 upon. It is therefore necessary to be careful in drawing
 conclusions from the results of the experiments. It is also
 necessary to be careful in the way in which the experiments
 are carried out. It is not enough to say that the results
 of the experiments are such and such. It is necessary to
 say how the experiments were carried out, and what the
 results were. This will enable others to repeat the
 experiments, and to see if they obtain the same results.
 It is also necessary to be careful in the way in which the
 results are recorded. It is not enough to say that the
 results are such and such. It is necessary to say what the
 results are, and how they were obtained. This will enable
 others to see if the results are reliable, and to draw
 conclusions from them. It is therefore necessary to be
 careful in all the details of the experiments, and to be
 careful in the way in which the results are recorded and
 interpreted.

answered oral questions and returned the survey questionnaires. The courtesies extended to the writer by private industry were also greatly appreciated.

The patience and encouragement afforded by my family during the school term helped me over the rough spots of writing this thesis, unfortunately it did not remove them.

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INTRODUCTION

Chapter I is an attempt to portray a picture of the public works function and to outline a management philosophy for the Public Works Centers. Chapter II is a discussion of the problems involved in the inter-organizational relations that exist within the shore establishment of the Navy, and illustrates the effect of these relationships on the commanding officer of a naval activity. Chapter III presents the results of the field survey conducted to determine if Public Works Centers, their customers, and the Civil Engineer Corps officer, were operating under different opinions as to what constitutes "reasonable service." Chapter III also contains the results of a survey to determine the impressions that customer activities have formed of existing Public Works Centers management, and the comparison of that opinion with the opinions of the Civil Engineer Corps officer on the type of image that public works center management should have. Chapter IV is a review and summary of the first three chapters with certain general recommendations.

CHAPTER I

ORGANIZATION FOR PUBLIC WORKS FUNCTIONS

CHAPTER I

ORGANIZATION FOR PUBLIC WORKS FUNCTIONS

Public Works

Public Works in the literal sense is the buildings and structures that make up the physical plant of a naval shore activity. In actual usage the term public works has come to mean much more.¹ In the colloquial the term public works is the organization whose purpose is " . . . the accomplishment of the inspection, operation, repair, and maintenance of public works, public utilities, and construction, transportation, and weight-handling equipment."² Public Works services can and do run the gamut from design and construction of exotic scientific facilities - to operating the daily garbage collection system that serves the local Navy mess halls and housing areas.

¹The only official definition of "Public Works" that could be found was in the since cancelled issue of the Bureau of Yards and Docks Manual (Bureau of Yards and Docks Instruction 5000.3 of 1 January 1954, p. 13-1):

"The term 'public works' at a naval shore activity to the building and structures including permanent fixtures therein and all fixed equipment pertaining thereto."

The term "public works" has become more embracing however in its daily usage and now includes the term "public utility" which is defined by the same cancelled BuDocks Manual, p. 13-3 as:

To accomplish the "public works" services within the Navy two basic organizations have been created; the Public Works Department organized within a naval activity, and the Public Works Center organized to serve many separate naval activities. Public Works Departments have been in existence in one form or another for many years. Public Works Centers are relatively new organizations, the concept evolving within the Norfolk Naval Base about 1950. Since 1950, five additional Public Works Centers have been established at the larger naval base complexes.

"A public utility is a fixed facility or system that provides a major service at a naval shore activity. Public utilities are also the services that are generally classified in commercial practice and that include related community services normally accepted as essential to the health and protection of the community. A public utility system is made up of structures and facilities that in themselves are classified as public works and may also comprise various items of construction, transportation, and weight-handling equipment."

A simpler definition of "public works" is provided by Commander John V. Noel, Jr., USN, in the Naval Terms Dictionary, (D. Van Nostrand Company, Inc., New York, 1952):

"Buildings, grounds, utilities, other structures, and land improvements at a naval shore activity."

This last definition is also lacking, in that it fails to include the responsibilities assigned to public works in the area of transportation, construction, and weight-handling equipment, and the design and construction of the Navy's shore activities. Perhaps a new and all encompassing definition of public works is necessary and would assist in eliminating confusion. I would favor public works as encompassing all the duties within the sphere of an activity public works officer to take advantage of the common usage of the term.

²U.S., Bureau of Yards and Docks, Organization and Functions of Public Works Departments, NAVDOCKS P-313, November 1960, p. 1.

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Public Works Center Concept

The Inspector General of the Navy in recommending to the Secretary of the Navy that public works centers be used to accomplish all "public works" functions within naval base complexes, stated that five advantages accrued to the Navy from the use of public works centers:

- a. Decrease in administrative, technical and supervisory overhead.
- b. Less investment in and consequently less maintenance cost for equipment.
- c. Uniform application of know-how by better and more highly qualified personnel.
- d. Reduction in shop stores, insurance items and shop store personnel.
- e. Reduction in maintenance shops and personnel.³

The concept of a public works center then is monetarily desirable because of savings through elimination of duplication of overhead in the form of manpower, inventories, equipment, and shops. The other main advantage of the public works center concept is that with the concentration of manpower, personnel with higher skill levels would be available. As a result of the Inspector General's recommendations, the Secretary of the Navy directed that a pilot operation be conducted at the Naval Base Newport to test the public works center concept when working on a must use basis for all public works functions.⁴ After a trial

³Report of Survey of BuDocks Managed Activities, Inspector General of the Navy to the Secretary of the Navy, March 6, 1959 (in the files of the Department).

period the Secretary of the Navy concluded that the public works center concept was valid and issued an instruction which made the use of Public Works Centers mandatory, rather than voluntary, for all activities adjacent to Public Works Centers.⁵ In his instruction the Secretary of the Navy stated:

The imperative need for austerity in support functions has led to the further study of the possibility of achieving economies in public works functions through more complete use of the services of Public Works Centers.⁶

and that the policy of the Secretary of the Navy would be:

. . . to consolidate public works functions into Public Works Centers at those naval complexes where Centers exist.⁷

The Secretary of the Navy in issuing this latter instruction, which was applicable in the areas served by six existing Public Works Centers, stated that:

. . . where . . . economically desirable, local arrangements may be made for the Public Works Center to assign personnel to activities to perform the following functions under the direction of the command concerned:

a. Perform minor day-to-day housekeeping type maintenance and repair work accomplished by the maintenance man rating as defined in

⁴U.S., Secretary of the Navy Instruction 5450.7, U.S. Naval Base, Newport, Rhode Island; consolidation of public works functions, August 4, 1959.

⁵U.S., Secretary of the Navy Instruction 5450.9, Consolidation of Public Works Functions at Naval Complexes with Public Works Centers; Policy for, June 30, 1960.

⁶Ibid.

⁷Ibid.

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NAVEXOS P-1005. Such personnel shall not perform major repair and installation work, or maintain a specialized trade shop.

b. Operate automotive, construction, and weight-handling equipment. No separate shop facilities will be provided for such personnel.⁸

This last instruction of the Secretary of the Navy states in a finite term the function to be performed by the Public Works Centers. The Public Works Centers (with the exceptions noted above) are to provide all public works services. The one other management feature incorporated into the Public Works Center concept is the use of the Naval Industrial Fund for financing the operation of most of the Public Works Centers. The Naval Industrial Fund provides a capitalization for a Public Works Center to provide operating cash or credit, and stipulates that each customer will be billed for the cost of direct labor and material used in his support, and for a pro rata share of the Public Works Center overhead costs. As noted in the Preface, the subject of Public Works Centers covers a wide spectrum, but it is in the area of the minor service functions where the most difficulty occurs.⁹

⁸Ibid.

⁹The four responding Public Works Centers, stated in their answers to the questionnaire, that their greatest difficulty lay in the area of the minor service functions, particularly minor job orders and emergency service work.

Minor Service Functions

The minor service functions at a Public Works Center are considered to embrace the following categories of jobs or operations:

1. Emergency maintenance or service work.
2. Minor maintenance job orders.
3. Janitorial service.
4. Groundskeeping.
5. Pest control service.
6. Minor automotive maintenance and servicing.

An examination of these jobs or operations will reveal their similarity to operations performed by most Americans in maintaining their homes and automobiles. In fact, when considering the total public works function, the minor service functions may well be considered to be a form of "housekeeping." It is interesting to note that the American Telephone and Telegraph Company refers to the work performed under items (1) through (5) as "house service."¹⁰

Everyone is an Expert.

The similarity between the tasks the average homeowner performs himself (or obtains from a local repairman) and the

¹⁰Interview with M. E. Vermillion, Plant Supervisor, The Chesapeake and Potomac Telephone Company, March 15, 1961.

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"housekeeping" service performed within the public works function may have subjected this area to an undue amount of criticism. A complaint concerning minor service may well be typified by the following one sided conversation of an activity department head speaking to his opposite number in the public works organization. "Boy, that organization of yours is sure something! I had to call three times yesterday to get someone to open a stuck desk drawer. Finally not one, but two men showed up. Two men just to open one desk drawer. Why if I had had a screwdriver, I could have finished the job myself in about two minutes. Boy, what an organization!"

Service is the goal.

Whether the impatient department head had a real need to have his desk drawer opened, or merely was seeking the latest issue of Sports Illustrated, will never be known. From a true service standpoint, the determination of real need is of little consequence. The commercial serviceman who answers a call to fix a TV set, unstop a toilet, or start a stalled automobile, does not normally question the validity of the service requirement. As Naval Officers first, the Public Works Officer or Commanding Officer of a Public Works Center has an obligation to advise the activity commanding officer of service requests that are wasteful of government funds. Good service and good

customer relations do not stem from a hypercritical attitude concerning the validity of every service request. Time spent in complaining about the validity of service requests is often lost, when it might be well applied to performing the job faster.

Objectives of Public Works Center Management

Managing a large organization without a well stated management philosophy and/or objectives is like steering a rudderless sail boat. You might have the best sail handlers available, but each small shift in wind direction or wind velocity requires action by the whole crew, rather than the involving only the man controlling the rudder. A management philosophy or objective is like a rudder, it assists you in staying on course with a minimum of lost motion. Although the Navy states the mission of an activity at great length, seldom is a complete management objective for an activity stated. Ernest Dale points out the need for management objectives by stating:

The organization structure is a mechanism designed to help in achieving the goals of the enterprise. However small an organization, it must start by determining its objectives. For the resources of any organization are limited and must be properly utilized if the company is to survive and to prosper. This requires a formulation of objectives and an assignment of responsibilities.¹¹

The Navy's use of "mission" might be best related to Dale's "assignment of responsibilities."

The mission of a Public Works Center is typically stated: "To provide public works, public utilities and transportation support, including engineering services incident thereto, as directed by competent authority."¹² It must be admitted that the wording of this mission is a little less than dynamic.

Gardner and Moore pointed out that the objectives of business must be dynamic. At the risk of boring the reader a long quotation is used because no method of shortening the quotation without loss of content could be found.

If we examine the objectives of any business, they appear at first blush to be simple and uncomplicated. Sears, Roebuck and Company, for example, sells goods direct to the consuming public; United Air Lines provides air transportation; Corn Products Refining Company grinds corn; and each company performs these functions at a profit. The picture appears complete enough; yet it lacks something! It is too dead, too static! There is no explanation of the dynamic aspects of business enterprise, of the drive, motivation, and compulsion which characterize men in business.

Our description assumes that each company more or less passively occupies a particular technological or economic position in our society. It in no way

¹¹Ernest Dale, Planning and Developing the Company Organization Structure, AMA Research Report No. 20, American Management Association, New York, 1952, p. 23.

¹²U.S., Bureau of Yards and Docks Instruction 5450.53A, Promulgation of tasks and functions of Public Works Center, Newport, Rhode Island, January 19, 1959.

describes the manner in which this position has been secured by the business enterprise in question, nor does it even suggest the struggle and effort which goes into the maintenance and development of this position once secured. The fact remains that a business enterprise is not just an organization fulfilling certain technological or economic functions. It is a far more active force than this. Indeed, it is largely a dynamic expression and embodiment of the efforts of a group of men to secure, consolidate, and extend a profitable position in the business community.

We all know, at least abstractly, that any business, to survive and prosper must maintain a set of relations with various elements in the socio-economic environment. These elements are, for the most part, described in terms of certain socioeconomic roles, such as investors, customers, vendors, management, labor, etc. Each of these groups supply one or another of the essential "ingredients" of business enterprise. Investors supply money; vendors supply materials, machines, tools, and products; customers supply buying power; labor supplies skill and work effort; etc. Each will provide the necessary "ingredients" which are in his power to give if he is "induced" to do so.

The major questions in every businessman's mind are: "How can the other party be 'induced' to part with his money, materials, machines, tools, goods, labor, ideas or services?" and "How can a 'gain' be secured in these transactions?" Finding answers to these questions is intriguing but difficult because the socioeconomic environment with which the businessman must deal is complex, frequently unpredictable, and constantly changing. It is apparent that the businessman cannot have complete information about the world around him. Therefore, his answers often are simply good guesses, based at best on an analysis of probabilities and at worst on pure hunches. The test of his guesswork lies in what happens in the future.

In spite of the difficulties, the socioeconomic environment can be manipulated and controlled in various ways. However, you have to find the right

formula or strategy, and play it to the limit. Indeed, it is frequently in the determination, single-mindedness, and purposefulness of the player that we find the difference between success or failure in business. A businessman can, if he is imaginative and aggressive, envision and act on a business situation not yet perceived by others. He can, if he is persuasive, change the perception of others regarding a particular business situation. Within certain legal and ethical limits, he can utilize every political, psychological, social, technological, and economic device in the books to achieve an advantageous position.¹³

The authors conclude:

Our description is by no means complete. However, we can begin to sense the dynamic aspects of business enterprise. It is essentially a game of strategy in which the participants seek the right formula for dealing with the various elements of the socioeconomic environment. It is a purposeful, goal-directed game where every move should fit into the overall strategic objectives of the business. It is an undertaking where the stakes are high, where control is possible, and yet where there is sufficient unpredictability to provide an element of chance. This is the kind of situation, it will be recognized, that excites people, motivates them, puts them on the edge of their chairs. It absorbs interest and attention, concentrates energies, and creates an almost consuming interest. . . . While most businessmen are not as keyed up as our description would indicate, never-theless, something like this underlies the compelling drives and interests of business management. Under these circumstances, it is understandable why problems of human relations in industry sometimes appear outside the world of reality to management.¹⁴

¹³Burleigh B. Gardner and David G. Moore, "Business Objectives and Strategies," Selected Readings in Management, ed. Fremont A. Shull, Jr. (Homewood, Illinois: Richard D. Irwin, Inc., 1958), pp. 109-110.

¹⁴Ibid., pp. 110-111.

Perhaps a more dynamic objective for public works centers might be an aid to "induce" the customers to seek the opportunity for service offered by Public Works Centers.

Management Philosophy

The Chief and Deputy Chief of the Bureau of Yards and Docks have expressed their philosophy for Public Works Center management. In addressing a conference of the Commanding Officers of Public Works Centers, the Deputy Chief stated, "If you can do a job cheaper, better and faster than anyone else, you'll get the job."¹⁵ At the same conference, the Chief of BuDocks expressed his view on the external problems of managing a public works center by stating:

It is more and more apparent that some of our problems arise from our customer's inability to understand and appreciate our difficulties, and from our inability to place ourselves in the customers shoes. Nothing can be substituted for personal interest in, and close contact with customer problems, and an understanding of them.¹⁶

Perhaps a mission for public works centers might then be stated that would combine the more dynamic philosophies expressed by the Chief and Deputy Chief, with the existing mission

¹⁵Captain P. Corradi, CEC, USN, Keynote Address, Public Works Center Conference, Norfolk, January 11, 1960, Proceedings, p. 28.

¹⁶Rear Admiral E. J. Peltier, CEC, USN, Address, Public Works Center Conference, Norfolk, January 13, 1960, Proceedings, p. 6.

statement. Such a mission might be stated--To provide public works services cheaper, better, and faster than anyone else, through the use of technical skills and a personal interest, knowledge, and understanding of the customers' problems.

Summary

Public Works Centers were created to provide services at the least cost to the Navy as a whole, through the use of consolidated facilities, elimination of duplication of functions, and increased technical skill. Management situations are seldom static, and like any service organization Public Works Centers must use a positive, dynamic approach to meet the changing needs of their customers.

CHAPTER II
IN THE CUSTOMERS' SHOES

CHAPTER II

IN THE CUSTOMERS' SHOES

The Shore Establishment Organization

A review of the shore establishment environment and the relationships that exist among its components is considered necessary, for the study of Public Works Centers as if they existed in a vacuum might lead to theoretical conclusions that would have little application in actual practice. The Public Works Centers exist in an environment composed of other naval activities, and these other activities are the sole reason for the Public Works Centers' existence.

The Bi-linear Organization Structure

In our economy there are two basic processes. One is production--the creation of goods and services. The other is marketing--the activities by which goods and services flow from the producer to the ultimate consumer.¹

Such a definition of our national economy leads us to believe that there are two basic functions taking place within the

¹Myron S. Heidingsfield and Albert B. Blankenship, Marketing, (New York: Barnes and Noble Inc., 1957), p. 1.

economy, production and marketing. It is suggested that consumption is also a function, and perhaps the most important one. The Navy has for some years been operating under a bi-linear organization which resembles the national economy in organization. The production and marketing functions are performed by the shore establishment for the ultimate consumer--the operating fleet. A fleet is a military force composed of manpower, material, and equipment. The shore establishment is a complex, with Bureaus and Offices at the head of the establishment, managing and directing the efforts of the many separate activities in the field. Control of the shore establishment is exercised through three devices, management control, technical control and command.

Management and Technical Control

Management control is defined as "The direction exercised in other than military matters, by an authority of the Naval Establishment over a unit of the naval shore establishment in the administration of its local operating functions."² Technical control is defined as "The specialized or professional guidance and direction exercised by an authority of the Naval Establishment in technical matters."³

²U.S. Department of the Navy, Navy Regulations, (1948), Article 0405, p. 36.

³Ibid.

Management and technical control can perhaps be better explained by reference to an area where one Bureau exercises both management and technical control. The following citations concern implementation of maintenance management procedures and are from the same reference but directed to different management entities of the shore establishment. To an activity under its management control the Bureau directive states:

Compliance with the Controlled Maintenance procedures and criteria established in this publication is mandatory for those activities under the management control of the Bureau of Yards and Docks. Other management bureaus and offices of the Navy Department have issued specific instructions for compliance of activities under their management control.⁴

Technical control is expressed in the following manner:

Proper management and control over the maintenance and operation of public works and public utilities is a command function. In the exercise of this function, Commanding Officers are guided by the directives of their management bureaus and the instructions and publications issued by this Bureau in discharging its technical responsibilities.⁵

The exact reactions of an activity in responding to these two types of control is impossible to predict. It should be recognized however that funds flow through or from the

⁴U.S., Bureau of Yards and Docks, Maintenance Management of Public Works and Public Utilities, NAVDOCKS P-321, December 1959, Article A 101(4), p. 1.

⁵Ibid., Article A 2.04, p. 2.

organization exercising management control. Without sufficient funds, the activity soon becomes a sterile entity or ceases to exist. From the standpoint of dollar availability it might be inferred that management control is the paramount control over a shore activity, with technical control having the lesser effect. Observations of actual practice by the writer tend to confirm this statement.

Command Concept

The responsibility of the Commanding Officer for his command is absolute, except when, and to the extent, relieved therefrom by competent authority, or as provided otherwise in these regulations.⁶

This article cited from Navy Regulations leaves little doubt as to the total responsibility for a command except when " . . . relieved therefrom by competent authority," Total responsibility in this era of complex government regulation, while operating under the "management-technical" control concept of the Navy, is difficult to imagine. In the years prior to radio communication it was essential that Naval Commands operate at their own discretion. No means of control other than general guidelines to act in the best interest of the sovereign was feasible. To indicate how deeply the "command concept" is ingrained in Navy tradition, the current edition of the Navy

⁶Naval Regulations, (1948), loc. cit., Article 0701, p. 81.

Comptrollers Manual uses the following statement as a preface.

On the sea there is a tradition older even than the traditions of the country itself. It is the tradition that with responsibility goes authority, and with them both goes accountability.⁷

This strong tradition of "absolute" command has been carried into the present day Navy. It is not considered appropriate that the merits of the Navy's organizational concepts be discussed within this study, particularly at a time when top levels of the Defense Department are discussing this same subject. It is essential however that it be recognized, that with the designation as "Commanding Officer"--authority, responsibility, and accountability are simultaneously assigned. Further, that the legal assignment of these duties is backed by traditions " . . . older even than . . . the country itself" Concepts such as these have a great deal to do with the relationships that exist within the naval establishment, and in particular the Naval Bases.

Naval Bases

To provide the "producer-marketing" support required for Fleet operations the Navy has created within certain larger harbor areas a complex known as the naval base. A naval base

⁷U.S., Navy Comptroller Manual, NAVEXOS P-1000, Vol. I, p. 111.

is defined as "that agency in a given locality which comprises and integrates all naval activities capable of contributing to its mission. The mission of a naval base is to furnish direct service to the operating forces."⁸

A naval base for major fleet support has a wide range of "producer-marketing" activities. The base activities may include a shipyard or ship repair facility, training commands or schools, air stations, medical facilities, supply depots, and more recently, the public works center. Each of the component parts of a naval base is normally under the separate command of an officer who has been trained in the skills necessary to accomplish the particular mission of his activity. The naval base as an entity is under the command of a senior officer of the line experienced in fleet operations and requirements. The Navy normally follows the policy of centralizing functions. The typical Naval Base represents a complex of activities organized on a functional basis, in an effort to achieve economy and efficiency. To provide insight into the depth of functionalization as it exists at most Naval Bases, the following list of activities located at the Naval Base, Newport, Rhode Island, is helpful:

⁸U.S., JOINT CHIEFS OF STAFF, Dictionary of United States Military Terms for Joint Usage, June 1948, p. 12.

Naval Station	Naval Reserve Training Center
Naval School, Naval Justice	Sub-Board of Inspection Center
Marine Barracks	District Printing Office
Fleet Training Center	Marine Reserve Training Center
Naval Communications Station	Fleet Camera Party
Navy Accounts Disbursing Office	Fleet Motion Picture Exchange
Naval War College	Harbor Defense Unit
Naval Underwater Ordnance Station	Fleet Boat Pool
Naval Supply Depot	Central Torpedo Office
Naval Degaussing Station	Mobile Target Repair Party
Naval Magazine and Net Depot	Public Works Center ⁹

The Individual Shore Activity

In the management of the individual shore activities the same command concept of complete responsibility and authority of the commanding officer has to some degree determined the shape of the activity. The commanding officer has generally been provided with all the "things" necessary to perform his particular mission. In most instances the activity organization and physical plant has been predicated on the basis that each activity will be as self-supporting as possible. Ultimately, economic considerations have to some degree governed the organizational structure and physical facilities. Most activities resemble a small community having the physical facilities and personnel peculiar to its mission performance, and including a range of internal support facilities. In any community it is necessary to provide for the maintenance and operation of the

⁹U.S., Bureau of Yards and Docks Instruction 5450.3A, January 19, 1959, promulgation of tasks and functions of Public Works Center, Newport, Rhode Island.

community property. The consolidation of the community maintenance and certain operation functions into one management group referred to as "public works" was discussed in Chapter I.

Pressures on the Individual Activity

Within the naval base complex an individual activity is subjected to an array of pressures. Pressures on management can be classified simply as internal and external.

Internal Pressures

A student of management is soon aware of the redundancy in management literature. Whether one wishes to use the formal approach of scientific management fostered by the early writers such as Frederick W. Taylor and Frank B. Gilbreth, or the less formal approach suggested by such writers as Elton Mayo, Herbert A. Simon, and Manley Howe Jones, one thing is fairly certain--when you manage people you have "people" problems. Naval activities like any other business must be concerned with pressures from individual employees and employee groups. It is normal for employees to strive to better their position at their place of employment. Betterment may be achieved through a change in; hours worked, pay or benefits, work rules, and physical working conditions. Betterment may be achieved through the efforts of individuals or groups of employees. Human beings like organizations are not static but dynamic therefore the

drives of employees are also constantly changing. It is fairly obvious that every naval activity is operating with these internal pressures, excited by individuals or groups each attempting to better their position within the total activity.

External Pressures

A naval activity is subjected to pressures from neighboring activities who may be competing for control of certain functions. Management control and technical control from the Bureau level was discussed previously, but it must be recognized that this is a form of external pressure. In the case of a naval base, military control is exerted by the base commander, another form of external pressure. Last but not least is the pressure exerted by the customers of the activity. Figure 1 portrays the naval activity in the form of a marionette to illustrate the conflicting internal and external pressures that are in constant operation.

Summary

Even the crude caricature of the pressures acting on naval activities that has been presented, leaves little doubt that to have "a personal interest in, and close contact with customer problems, and an understanding of them,"¹⁰ is no small

¹⁰Rear Admiral E. J. Peltier, loc. cit.

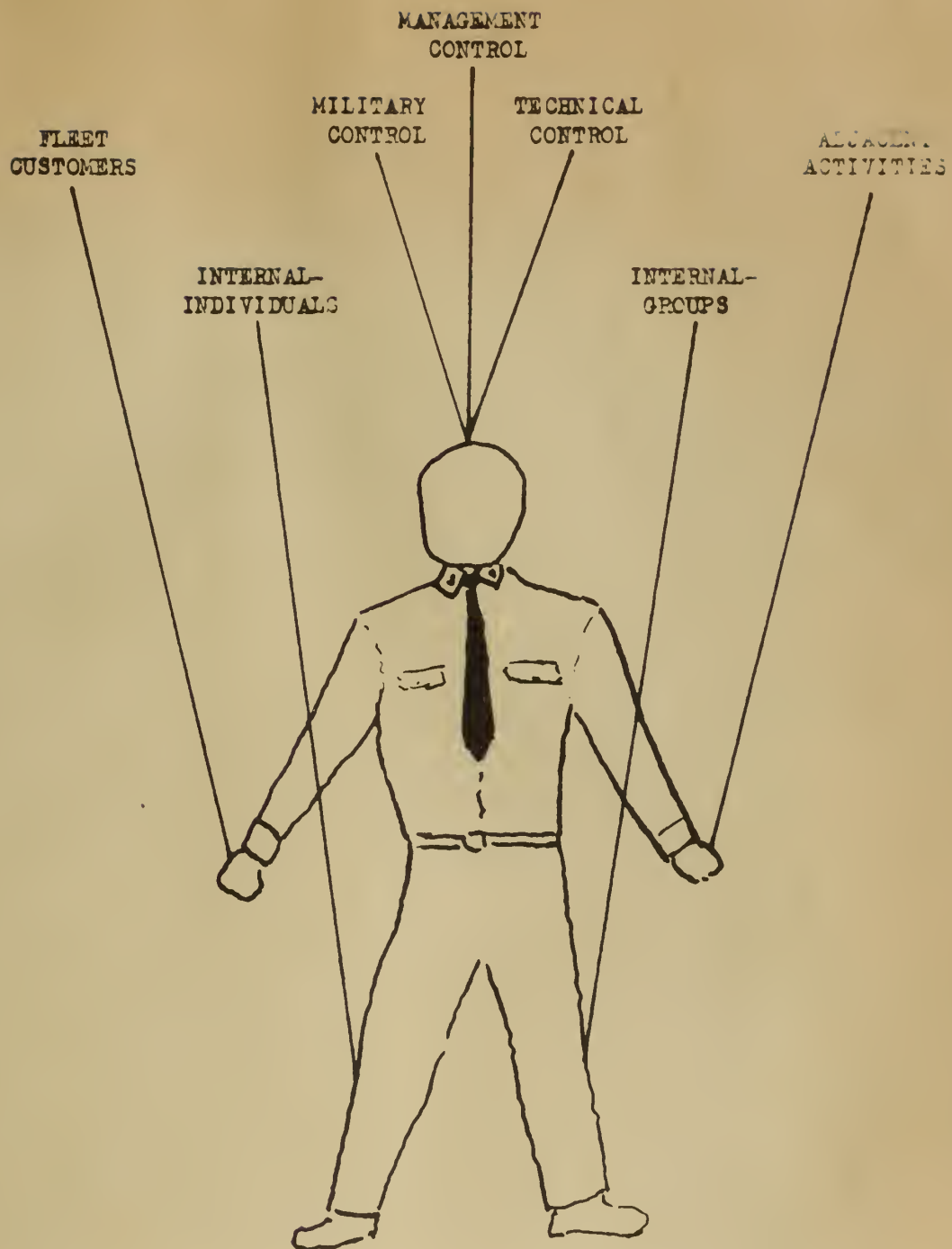


Fig. 1.—Caricature of the conflicting external and internal pressures that are constantly being applied to naval shore activities.

task. To obtain a clear understanding of the customers' problems and the ability to react properly to the customers' needs may well be one of the biggest management problems for any naval shore activity. The difficulty is perhaps magnified again when considered in relation to Public Works Centers, which in reality are in the second line of the shore establishment support function, supporting the supporters of the fleet. To the average customer the Public Works Center falls in the category of adjacent activity, and the Public Works Center can expect little assistance in solving its own internal management problems.

CHAPTER III

FIELD SURVEY ON SERVICE CRITERIA

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Service

In "Roget's Thesaurus" we find the word "service" falling within the category of words associated with the voluntary powers, and in the sub-categories of subservience to ends, and individual volition.¹ Service is associated with such words as; benefit, advantage, improvement, good, interest, behalf, usefulness, efficacy, efficiency, adequacy, etc. The important point is that "service" by definition is voluntary in nature, and secondly that it implies the provision of a good or benefit to a second party. When the word "service" is used hereafter, it will be used in the sense that it is an effort being made because of a desire to perform some form of benefit for a second party.

The Customer's Viewpoint

In any consumer-producer relationship it is often worthwhile to perform some type of marketing research. Without

¹C.O. Sylvester Mawson, Roget's International Thesaurus of English Words and Phrases, (New York: Thomas Y. Crowell Company, 1924), p. 252.

much effort we can point to many examples which indicate that marketing research may lead to wrong conclusions. A good example is perhaps the Ford Motor Company's introduction of the medium priced Edsel, just at the time when compacts and small imports were entering into popularity. Like all good Monday morning Quarterbacks, even we can see the error, however, marketing research is intended to " . . . increase marketing information, and therefore . . . help to reduce business risks."² In the area of minor service functions we have research information which indicates that the customers of public works centers felt that public works service must be "responsive to command" and that the public works services must be provided at a reasonable cost.³ "Responsive to command" and "reasonable cost" are rather vague in application. When is service responsive? What is a reasonable cost of service?

Establishing Value

In answering these two questions one must recognize that no mathematical criteria or fixed rule can be developed that would define "responsiveness" and "cost" for every instance. Value or worth depends entirely on the market at the time of sale, and the conditions of sale. A look at the market for our

²Heidingsfield and Blankenship, loc. cit., p. 173.

³Report of Survey of BuDocks Managed Activities, loc. cit.

most common commodity - water, will help to illustrate the "value" contention. The householder who finds the flooding Mississippi at his doorstep would pay a considerable sum not to have water, at least, Mississippi flood water. On the other extreme, the traveler in the world's many desert regions may find water priceless, particularly when his supply of water is negligible. The "value" principle for service functions has application when applied to the customers of Public Works Centers. At times service within the minor public works functions is priceless, at other times even a small cost might be prohibitive. Power failure at an electric typewriter may or may not be as important as power failure at the electronic data processing room. Determining the service need is of the nature of a "value" judgment. It does not appear possible to establish one set of criteria which would allow us to evaluate each service need in relation to the timeliness of its performance and cost, particularly when there may be more than one service need competing for the manpower material and equipment essential to perform the service.

Reasonable Service and Cost

Fully recognizing the limitations of attempting to define reasonable "responsiveness" and "cost" some decision criteria should be established by top management which would assist personnel at the lower echelon to make better decisions which affect

responsiveness and cost of service. In an attempt to provide a frame of reference for decision criteria in the area of minor public works service functions the writer conducted a survey. Included in the survey were major customers of public works centers, a randomly selected group of Civil Engineer Corps Officers, the Public Works Centers, and a small group of the larger private concerns involved in customer service functions. The validity or value of this type of "market" survey may be subject to question. Heidingsfield and Blankenship point out that:

If the research method is used carefully, with full understanding of its strength and weakness, it can, indeed, be a valuable aid to marketing efficiency. Marketing research, like accounting and the other tools used in the administration of a business, can help to increase the accuracy of an executive's judgment.

However, no properly trained market researcher would ever claim that marketing research is a panacea for all the problems of business. Market study is no substitute for the experience and training which a man in business has acquired in his particular field. Even so, a businessman is sometimes so close to his own operation that "he cannot see the forest for the trees." Thus, he may make a decision based on limited observations which ignore what is going on beyond the narrow scope of his own business activity. In such cases, marketing research may make its greatest contribution. It may furnish the businessman with an objective and dispassionate analysis of all the related data, which will enable him to make a realistic judgment or decision.⁴

⁴Heidingsfield and Blankenship, loc. cit., p. 179.

It is not the claim of the writer that the results of this survey will provide "an objective and dispassionate analysis of all the related data." It is hoped however, that it might be of value, if only to re-emphasize known problem areas.

The customer survey was restricted to the customers who received the majority of their support from the adjacent Public Works Center. Fifty-two customer activities were mailed a questionnaire intended to develop information in three areas closely related to the minor public works services:

1. What is reasonable service?
2. What is a reasonable charge for service?
3. What service image have the managements of Public Works Centers presented to their customers?

The response to the questionnaire was from a recording and evaluation standpoint a little overwhelming - forty-three replies were received representing a return of 82 per cent.⁵

To obtain a reference guide, a similar survey was forwarded to a randomly selected sample of Civil Engineer Corps officers in the grades of lieutenant through captain.⁶

A minor effort was made to contact certain large private

⁵See Appendix I for the format of the customer questionnaire.

⁶See Appendix II for format of the CEC questionnaire.

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concerns involved in some form of minor service functions. Four private concerns were contacted and personnel from three firms were actually interviewed. Interviews were conducted at the Chesapeake and Potomac Telephone Company; Federal Systems Division, International Business Machines Corporation; and the Consumer Products Branch, Radio Corporation of America Service Company. These concerns were surveyed because it was found that each was engaged in performing servicing operations for customers under conditions somewhat similar to those operating conditions found at Public Works Centers.

Reasonable Service

The term "reasonable service" is restricted in this instance to efficacy of service, the results of the service rather than its ultimate cost. Cost was considered in another part of the survey and will be related to efficacy of service at a later time. To define reasonable service many ideas were selected and discarded prior to deciding on the final form of survey interrogation. The customer was provided with a list of twenty minor service work items containing some of the most frequent service or trouble-calls received by public works organizations.⁷ The respondent was asked to evaluate for each

⁷The list was prepared using the writer's experience in three Public Works Departments, and was checked by three senior officers to determine that the list was fairly representative of minor service jobs.

type of service item, the maximum reasonable delay in hours before a serviceman arrived. The respondent was given the opportunity to select the delay he considered to be reasonable for the service to be performed from one of seven alternatives.

Customer Response

Of the 43 customer respondents three provided no information at all because they misunderstood the questionnaire. For the particular question on reasonable service, seven per cent of the individual service items were not customer evaluated because of non-applicability in their operation, etc. Of the remaining ninety three per cent of the service items, the totals in any one of the seven alternatives is shown in Table I.

TABLE I

CUSTOMERS OPINION OF REASONABLE DELAY

Delay in Hours	Per Cent of Jobs
1	17
2	17
4	19
8	12
24	15
48	10
Over 48	10

Table II provides a tabulation of the same information contained in Table I, but in a slightly different presentation. Table II shows the frequency of calls that fell within a specified delay period.

Using Table II, certain observations can be stated. The customer expects that ninety per cent of the jobs will be started within forty eight hours or two working days, eighty per cent of the jobs will be started within twenty four hours or one working day, and that sixty five per cent of the jobs will be started within eight hours. It is interesting to note that slightly over half the emergency service jobs would have to be started within four hours to satisfy the customers' view of reasonably responsive service.

TABLE II

CUSTOMERS RANGE OF MAXIMUM REASONABLE DELAY

Hours of Delay	Per Cent of Service Items in Range
0 - 1	17%
0 - 2	34
0 - 4	53
0 - 8	65
0 - 24	80
0 - 48	90
0 - Over 48	100

The next question might well be, is the customers view of what constitutes responsive service really reasonable? A comparison using a survey of CEC officers will show that the customers view of "reasonable service" is not foreign to the view held by the CEC officer group.

CEC Response

One hundred and six questionnaires were forwarded to randomly selected CEC officers; eighty three replies were received, or a response of seventy eight per cent.⁸ The high level of response indicates not only an interest in the subject but that the information provided may be used in making comparisons or drawing conclusions with some assurance of validity. Three of the replies were received after final tabulation had taken place so are not included in the surveys. Of the eighty replies evaluated the experience level of the respondents in the public works area was found to be:

1. 10 years and over - 28
2. 5 to 9.9 years - 22
3. 4.9 years and less - 30

It is considered that the sample obtained provides adequate experience coverage and that Table III reflects the thinking of a cross section of experience qualified CEC officers.

Results of Surveys on Reasonable Service

The similarity between the views of the Commands and the CEC officers surveyed is rather striking. The similarity

⁸See Appendix II for the format of the CEC officers questionnaire.

TABLE III

CEC OFFICERS OPINION OF REASONABLE DELAY

Delay in Hours	Per Cent of Jobs
1	19
2	12
4	21
8	14
24	15
48	9
Over 48	10

TABLE IV

CEC OFFICERS RANGE OF MAXIMUM REASONABLE DELAY

Hours of Delay	Per Cent of Service Items in Range
0 - 1	19
0 - 2	31
0 - 4	52
0 - 8	66
0 - 24	81
0 - 48	90
0 - over 48	100

indicates that as a group, CEC officers share the opinion expressed by the Commands as to "what is a reasonable delay in service." In addition to the expressed awareness of the CEC officers to desires of the Commands in order to have responsive service, the surveys point out another interesting facet. If general criteria for reasonable service were to be developed, recognizing the limitations expressed before, a rule of thumb may be stated. In reviewing minor service functions that are

Table IV

THE EFFECT OF TEMPERATURE ON THE RATE OF REACTION

Time in days

Rate of reaction

10
15
20
25
30
35
40

1
2
3
4
5
6
7

Rate of reaction

Table V

THE EFFECT OF TEMPERATURE ON THE RATE OF REACTION

Time in days

Rate of reaction

10
15
20
25
30
35
40

1
2
3
4
5
6
7

Rate of reaction

It is evident from the above that the rate of reaction is directly proportional to the temperature.

The rate of reaction is also directly proportional to the concentration of the reactants.

The rate of reaction is also directly proportional to the surface area of the reactants.

The rate of reaction is also directly proportional to the pressure of the reactants.

The rate of reaction is also directly proportional to the volume of the reactants.

The rate of reaction is also directly proportional to the mass of the reactants.

The rate of reaction is also directly proportional to the number of moles of the reactants.

The rate of reaction is also directly proportional to the density of the reactants.

of an urgency requiring a telephone request for service, at least fifty per cent must be answered within four hours if the customer is to be furnished with service that is satisfactory in his viewpoint. Another question might be used, is the survey indication reasonable in the sense that service on fifty per cent of the jobs within four hours is attainable. Information collected from the four largest Public Works Centers indicates that over seventy five per cent of the Emergency Service work jobs performed are accomplished in less than four hours on a center-wide basis.⁹ It appears that if seventy five per cent of the jobs take less than four hours, it should be possible to have enough leeway to be able to get to the work site and be ready to start on fifty per cent of the jobs within four hours. Problems of this nature however are not as simple as they appear on the surface. Solutions to similar "waiting line" problems have been suggested through the use of "operations research" techniques.

Survey of Private Industry

One of the private concerns worked toward a goal considering that ideal service was provided the same day. In this particular organization if the backlog rose above thirty per

⁹Interview with Mr. H. K. Lowery, Manager, Technical Programs Branch, Shore Establishments Division, Bureau of Yards and Docks, March 29, 1961.

to be properly interpreted, a full and complete knowledge of the
facts of the case is essential. It is not enough to know that
the defendant is guilty, but it is necessary to know the
circumstances of the crime. The law requires that the
evidence be such as to prove the guilt of the defendant
beyond a reasonable doubt. This is the standard of proof
in criminal cases. It is a high standard, and it is one
that must be met in every case. The law is designed to
protect the innocent, and it is not to be taken lightly.
The burden of proof is on the prosecution, and it is their
duty to prove the guilt of the defendant. The defense has
the right to challenge the evidence, and to present its own
case. The judge is the one who decides the law, and the
jury is the one who decides the facts. It is the duty of
both to do their job properly, and to follow the law.

It is the duty of the jury to decide the facts of the case,
and to return a verdict based on the evidence. The judge
is the one who decides the law, and it is his duty to
instruct the jury on the law. The jury must follow the
instructions of the judge, and must not be influenced by
any outside factors. The law is designed to protect the
innocent, and it is not to be taken lightly.

¹ The law is designed to protect the innocent, and it is not to be taken lightly.
The burden of proof is on the prosecution, and it is their duty to prove the guilt of the defendant.
The defense has the right to challenge the evidence, and to present its own case.

cent of their weekly volume of calls, local management was in for a rough time from the upper echelon. One of the other private organizations had a "same day" rule on trouble calls, however, scheduled non-trouble work on a two or three day basis where possible. The third firm was organized so that approximately thirty per cent of their service requests were received at a central dispatching organization. This firm had no service personnel working from a central shop. All service men were stationed in their assigned service area and reported by phone to the dispatcher for check in, out and specific orders. Depending on the problem, this third company tried to have service personnel available within two hours of trouble notification. One important point in common was noted. Each of the three firms informed their customers of the expected time that a serviceman would be available, and then made every effort to meet this general appointment. The three firms utilized some form of dynamic control systems to minimize delay times. If the calls could not be handled within the time established by company ground rules, overtime was used to keep the workload manageable and to satisfy the customer.

Reasonable Cost

Earlier in this chapter "reasonable cost" was stated as being difficult to define. A rather crude survey to obtain some

information on what constitutes a "reasonable charge for service" was attempted by asking respondents to select a "maximum reasonable charge in dollars" from a selected list of twelve service items. This part of the general survey is subject to the same limitations discussed previously in this chapter. A basis for evaluation of the survey response is provided through engineering estimates obtained through the Area Public Works Office, Chesapeake.¹⁰

In studying the response to the surveys the reader is cautioned to remember that the list of twelve items is not purported to contain the most frequent jobs performed in the minor service area. The list was prepared to provide some means of looking at a variety of effort in different categories of service work. The questionnaire stated that the "reasonable charge should include basic labor, material, and allowance for overhead." The comparisons made in the area of reasonable cost must be evaluated for each service. There is no meaningful average cost for a list which includes only twelve items and has so many variations in service performed. The dollar cost shown as a survey response is expressed in terms of "maximum

¹⁰The cost estimates provided through the courtesy of LCDR Robert E. Dunnells, CEC, USN, APWO, Chesapeake, are based on Engineered Performance Standards. EPS allows for travel time and preparation time in addition to the normal time for service performance, therefore provides for the total direct labor costs. Material costs were obtained by the writer.

reasonable charge." The majority of the Public Works Centers operate under the Naval Industrial Fund and are therefore, in essence, self supporting. To be self supporting, it is necessary to charge each of the customers a pro-rata share of the overhead costs of the Center. The overhead rate varies and is recalculated when necessary so that neither loss nor gain occurs in the capital accounts. To obtain an average cost would be mathematically unsound using the data available, therefore overhead rates of fifty per cent and one hundred per cent of direct labor will be used with the "EPS" estimates for comparative purposes. The survey questionnaire indicated that for purposes of comparability all work sites should be considered to be within one mile of the public works shops area. To provide similarity in the matter of labor rates, each respondent was asked to base his estimates on skilled labor at \$3.00 per hour. Subject to all the limitations and qualifications noted above, Table V has been prepared to enable an evaluation of three areas:

1. Do the PWCen customers and CEC officers have similar opinions as to what constitutes reasonable cost?
2. Are the opinions of PWCen customers and CEC officers in line with the "standard cost" of the Engineered Performance Standards?
3. What is the effect of changes in overhead rate on "reasonable charges"?

TABLE V

ESTIMATES OF REASONABLE CHARGES FOR SERVICES

Service or Work to be Performed	Estimates Based on \$3.00 per Hour for skilled labor						
	Customer			CEC			"EPS" Estimate
	Mean	Mode*	Mean	Mode*	Direct	With 50%	O.H. of 100%
1. Unstop plugged water closet	5.6	4.0	4.0	4.0	2.4	3.6	4.8
2. Replace fluorescent tube in office with 10' ceiling	3.5	2.0	4.0	4.0	2.5	3.3	4.1
3. Change a sedan tire on the road	4.2	4.0	4.5	4.0	2.7	4.0	5.4
4. Construct and install a 3' x 4' celotex faced bulletin board	18.0	16.0	14.1	16.0	13.6	18.1	22.6
5. Replace an electric wall outlet fixture	6.0	4.0	6.5	4.0	3.0	4.0	5.1
6. Repaint a metal office desk	17.8	16.0	19.0	16.0	5.9	8.6	11.3
7. Replace a 12" x 20" window glass	7.5	8.0	5.9	4.0	2.6	3.6	4.7
8. Replace a washer in leaking faucet	3.5	2.0	2.4	2.0	1.5	2.3	3.0
9. Install new night latch in wood door	7.5	8.0	6.3	4.0	6.1	7.2	8.2
10. Truck crane makes one 2000 lb. lift to flatbed trailer from ground (2-man rig)	8.4	16.0	17.8	16.0	11.4	17.1	22.8
11. Clean a 10' x 15' office	7.1	4.0	5.0	4.0	.6	.9	1.2
12. Mow a lawn, 100' x 200', walking power mower	10.3	8.0	7.8	8.0	6.8	9.8	12.8
TOTALS	\$99.2	\$92.0	\$97.3	\$86.0	\$59.1	\$81.5	\$116.0

* In preparing Table V it was found that for each of the twelve items the median and the mode were in the same maximum reasonable charge class, further indication of the similarity of opinions.

Similar Opinions on Reasonable Cost

Table V indicates that Public Works Center customers and CEC officers have rather similar views as to what constitutes a reasonable charge for a particular service. Two methods of evaluation were used in Table V, the arithmetic mean and the mode. Because of the large differences allowed as alternative selections in the surveys (classes ranged from \$1 to over \$32) the arithmetic mean of the replies could and did vary. For example, thirty two respondents would have to select a charge of \$1 to offset a selection of \$32 by one individual. It will be noted that with the exception of item 10 in Table V, (the crane lift) the customer and CEC officer are talking about reasonable costs that are in the same "ballpark." To illustrate the point just made, if either the customer or CEC officer received a bill for \$5 to replace a leaking washer (Item 8, Table V), eyebrows, if not tempers might be raised. A \$5 charge to replace a faucet washer would more than likely be an "unreasonable charge" in the eyes of either respondent. It must be recognized that in this entire survey we are dealing with "opinion" as to reasonable charge, not a stated cost for a service.

A review of the mode (the alternative receiving the most "votes") for the twelve items in Table V, makes a stronger case for the similarity of opinion between the customer and CEC

groups. The customer and CEC groups have the same mode for maximum reasonable charge in nine of the twelve items in Table V, another indication of similarity of opinion as to what is a reasonable charge for service.

Opinions versus Engineering Estimates

Table V indicates that the "opinion" estimate versus the Engineering Performance Standard estimate shows greater dissimilarity between the "standards" and the "opinions," than was evidenced between the opinions themselves. Some of the disparity can be attributed to the method of surveying the respondents. The respondents were only allowed to select a class indicating a maximum reasonable charge while the Engineered Performance Standard estimates were made to the nearest tenth of an hour, and then costed.¹¹ To compare the "opinion" cost estimates with the "standard" cost estimate, a study of the differences between "opinions" and "standards" was made. Using the information found in Table V, the "EPS" estimate, with the fifty per cent and the one hundred per cent overhead rates applied was compared against the opinion estimates of the customer and CEC respondents. Table VI portrays this comparison,

¹¹This problem was recognized in preparing the survey questionnaire, but was accepted to simplify survey response and evaluation.

and shows that neither the customer nor the CEC group were significantly within twenty per cent of the "EPS" estimates at either the fifty per cent or one hundred per cent overhead rate.

TABLE VI
"OPINIONS" OF REASONABLE COST COMPARED
WITH ENGINEERED PERFORMANCE STANDARDS

Opinion Estimates	Rate of Being Within 20% of EPS Estimates	
	50% Overhead Rate	100% Overhead Rate
Customer Group		
Mean	42%	58%
Mode	67%	17%
CEC Group		
Mean	42%	50%
Mode	67%	33%

Table VI might infer that ability may be lacking to estimate costs reliably on the basis of opinion and still be within twenty per cent of the standard costs. The validity of the "EPS" cost estimates might also be questioned, however, we must establish some reference to work from, and will for purposes of this study accept the "EPS" estimates as being substantially correct. It is interesting to note from Table V that in nine of the items of work, the customer and CEC officer groups had "means" which were greater than the "EPS" estimate

with a fifty per cent overhead rate applied. The same comparison using the "modes" shows again that both respondent groups have "opinion" estimates higher than the "EPS" estimates. To some extent we must consider that the customer and CEC groups would tend to "guestimate" on the high side of the actual standard costs. This inability to gauge costs can be partially explained. Most customers are not operating adjacent to Centers with an overhead rate as low as fifty per cent, and therefore would be accustomed to higher charges for services. Engineered Performance Standards were developed to assist the CEC officer and his civilian counterparts, by providing a better method of cost evaluation. It may be inferred from the surveys that it is the tendency for customer and the CEC officer to have an opinion of reasonable cost that is higher than the "EPS" estimate, but only at a fifty per cent overhead rate. It should be pointed out that except for service items 6 and 11 of Table V, the customer, CEC and "EPS" estimates of reasonable cost are in the same "ballpark." One assumption can be made at this point, if costs for minor services were performed within standard cost rates for direct labor, and the overhead rate is limited to fifty per cent, the majority of the customers would be satisfied, and the average CEC officer would concur that the charge was reasonable.

with a light, low, even forehead with straight, low nose bridge
 and small, thin lips, which were very expressive. The
 face appeared to have a very slight smile, and the eyes
 were not so much as to be noticed, but the nose and the mouth

were not so "pleasant" as the rest of the face.

General remarks: With regard to the nose, it was not particularly
 striking, but the mouth and the expression of the face
 were all somewhat like to the rest of the face.

With the exception of the nose and mouth, the features
 appeared to be very similar to those of the face.
 and his entire appearance, in general, was very much like
 that of a man. It was in fact, the same as the

in the body, the nose and the mouth were very much
 similar to those of the face, but the nose was not
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Effect of Overhead Rate

In studying "reasonable" charge it was noted from Table V that when the overhead rate applied to the "EPS" estimate was one hundred per cent, a complete reversal occurred in correlation of "reasonableness" between "opinion" and the "EPS" estimate. Table VII illustrates that as the overhead rate increases, there is less chance that the respondent groups surveyed would consider the charge reasonable.

TABLE VII

EFFECT OF OVERHEAD RATE ON "REASONABLE COST"

Opinion Estimates	% Service Items Considered Reasonable	
	50% Overhead Rate	100% Overhead Rate
Customer Group		
Mean	75%	50%
Mode	67%	25%
CEC Group		
Mean	75%	33%
Mode	67%	17%

Two inferences may be drawn from a study of Table VII. First, there would be less chance of satisfying the customer at the higher overhead rate; perhaps a trite observation, but still fact. Secondly, if services could be provided for the cost of the Engineered Performance Standard estimates, and with no more

than a fifty per cent applied overhead rate, the majority of the customers would consider the costs reasonable.

Image of Public Works Center Management

Image in a technical sense is the figure of an object formed by rays of light. In the non-technical sense image may refer to an imitation of a person or thing, a likeness, a conception, an effigy or an idea.

In assessing the image of the Public Works Centers the approach was to establish an image considered desirable by the average CEC officer. This task was accomplished by using the field survey mentioned previously. At the same time the major customers of Public Works Centers were asked to comment on the "image" created by the Public Works Center which served them.¹² The CEC group was asked to designate on a list of 24 traits, the traits they considered to be; (1) Must have, (2) Desirable, or (3) Not Important, for effective management of a Public Works Center. The customers were asked to designate the traits which were applicable to the Public Works Center serving them by checking whether the trait; (1) Describes Well, (2) Partially Describes, or (3) Does Not Describe. The use of an "image" survey is not a new marketing technique, but one used to a

¹²See Appendix I for format of the survey questionnaire.

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great extent by the Bolger Company.¹³ One purpose of an image survey is to determine whether the "corporate image" you are trying to build, is really getting across to the customer. Public Works Centers are not engaged in advertising, but they are by definition of the term engaged in marketing. " . . . the activities by which goods and services flow from the producer to the ultimate consumer."¹⁴ It is considered worthwhile to determine what sort of an "image" Public Works Centers should have, and secondly, what sort of an image has the Public Works Center created in the mind of the customer to date.

Traits or Qualities of Management

An evaluation of management traits or qualities indicated that they generally fall into four categories, (1) dynamic or action traits, (2) cooperative or traits indicating ability to get along with others, (3) creativeness, and (4) the businesslike traits, the keystone of good management. After evaluating the responses received from the customers group and the CEC group, Figures 2, 3, 4, and 5 have been developed. Plotted above the base line are the positive, "Must Have" and "Describes Well" responses stated as a percentage of the total

¹³John F. Bolger, "How to Evaluate Your Company Image," Journal of Marketing, October 1959, pp. 7-10.

¹⁴Supra p. 17. The term "activities" does not refer to the sense of "naval activities."

response. Below the base line the negative, "Not Important" and "Does Not Describe," responses are plotted. A discussion of the merits of the responses by the CEC group will not be made except for one general comment. All of the traits listed on the questionnaire are of positive value, and it might be argued that any ongoing organization should possess all of these traits, perhaps even to a greater extent than the term "desirable" would indicate.

Action Image

Alert, lively, eager, vigorous, enterprising, and venturesome were the words used to describe the action traits or qualities. By their response (see Figure 2) the CEC officers have indicated that alert, vigorous and enterprising were the stronger "must have" traits. The customer response indicates that Public Works Centers have not been entirely successful in establishing an "action or dynamic image" in their customers' minds.

Cooperative Image

Cooperative traits were indicated by such words as open-minded, cheerful, friendly, kindly, charitable, and public-spirited, and modest. Figure 3 indicates that CEC officers in general did not feel too strongly that these traits were as essential as the traits in other categories. It is interesting

to note from the customer response that the Public Works Centers are considered to be rather highly rated for cooperative traits, seventy eight per cent of the respondents indicating that Public Works Centers were friendly, and fifty eight per cent indicating that the Centers' managements were cheerful. These two traits were rated first and third respectively in response by the customer respondents, and twelfth and thirteenth respectively by CEC officers.

Creative Image

A glance at Figure 4 will show that except for progressive, and forward-looking, the CEC respondents held no great brief for the creative category. The customers from their response did not take exception to the feelings of the CEC group except in the case of "modern." It is a moot question whether the general feeling that was evidenced by the largely negative CEC reply to the "artistic" trait is best for the Centers. Centers do control a large segment of the Navy's housing, and some of the Navy's larger administrative spaces. A little sense of the artistic might serve the Centers well.

Business Image

The surveys indicated that the "business like" traits are the symbols of righteousness, and the response from the CEC officers confirms their importance. Figure 5 indicates that

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CHAPTER III

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from the customers' viewpoint, the positive or "Describes Well" response was not as great in this area as the response for the cooperative traits, however the negative response was very low, a good indication. Perhaps in our desire for a cooperative spirit to help sell the Centers, we have gone overboard, and thereby have failed to impress the customer with a display of good business acumen.

Image Summary

The four management images, dynamic, cooperative, creative and business-like, are compared in Figure 6. It is apparent that if the views on "image" of the average CEC officer are given credence, the Public Works Centers should apply themselves to strengthen traits that express a dynamic organization and a businesslike approach. The writer also feels that the creative approach should not be neglected.



(Indicated in percent of total response)

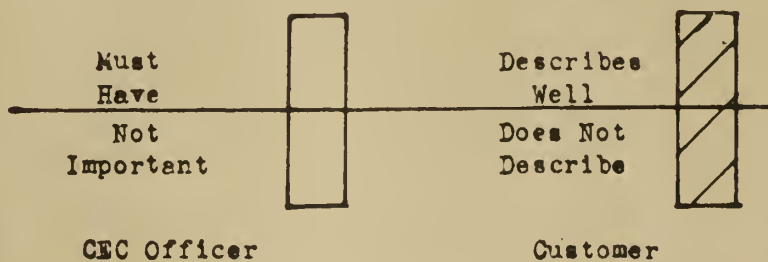


Fig. 3.--The Customers impression of Public Works Centers management compared with the image considered necessary by the CEC officer for the dynamic or action traits of management.

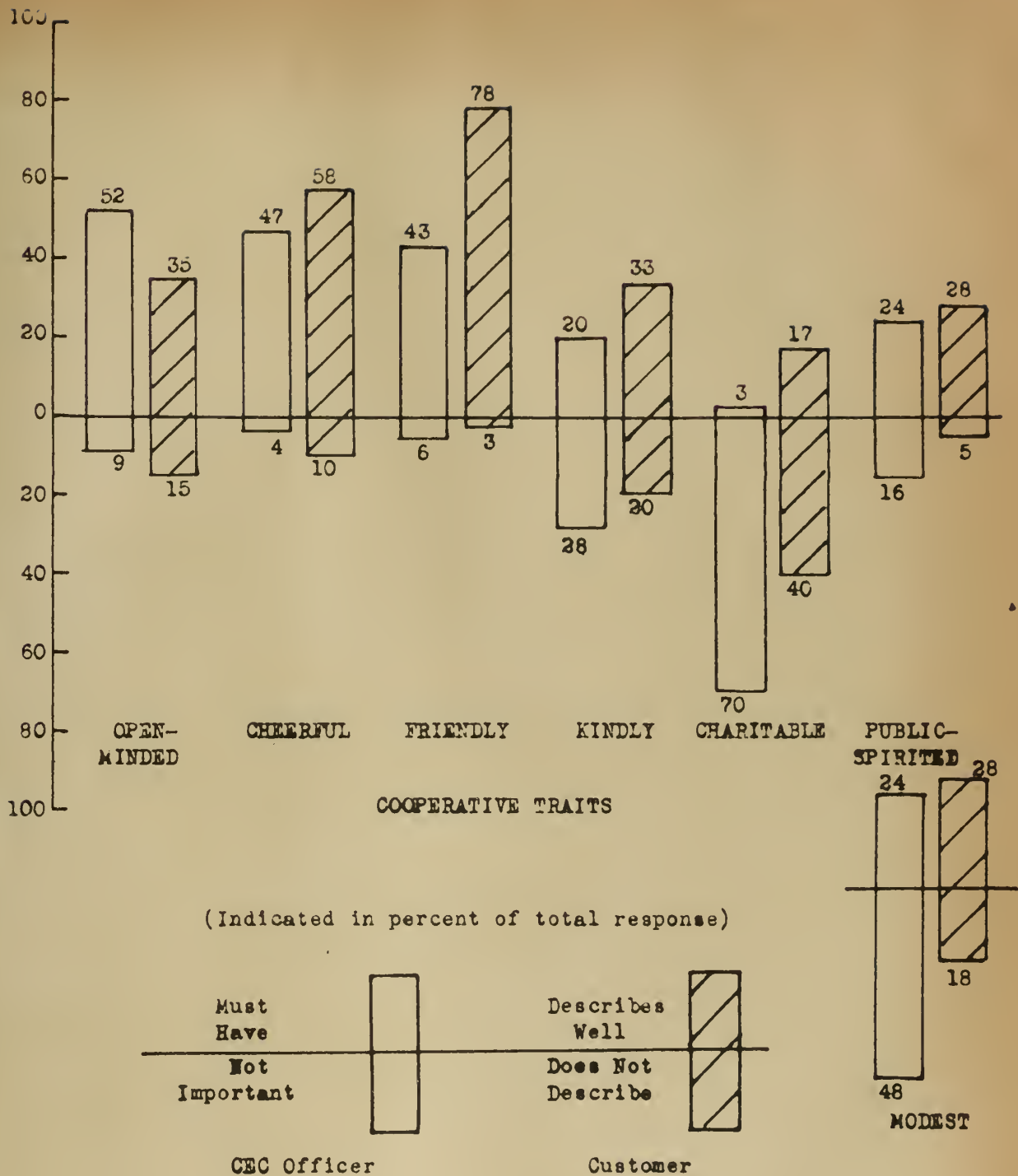
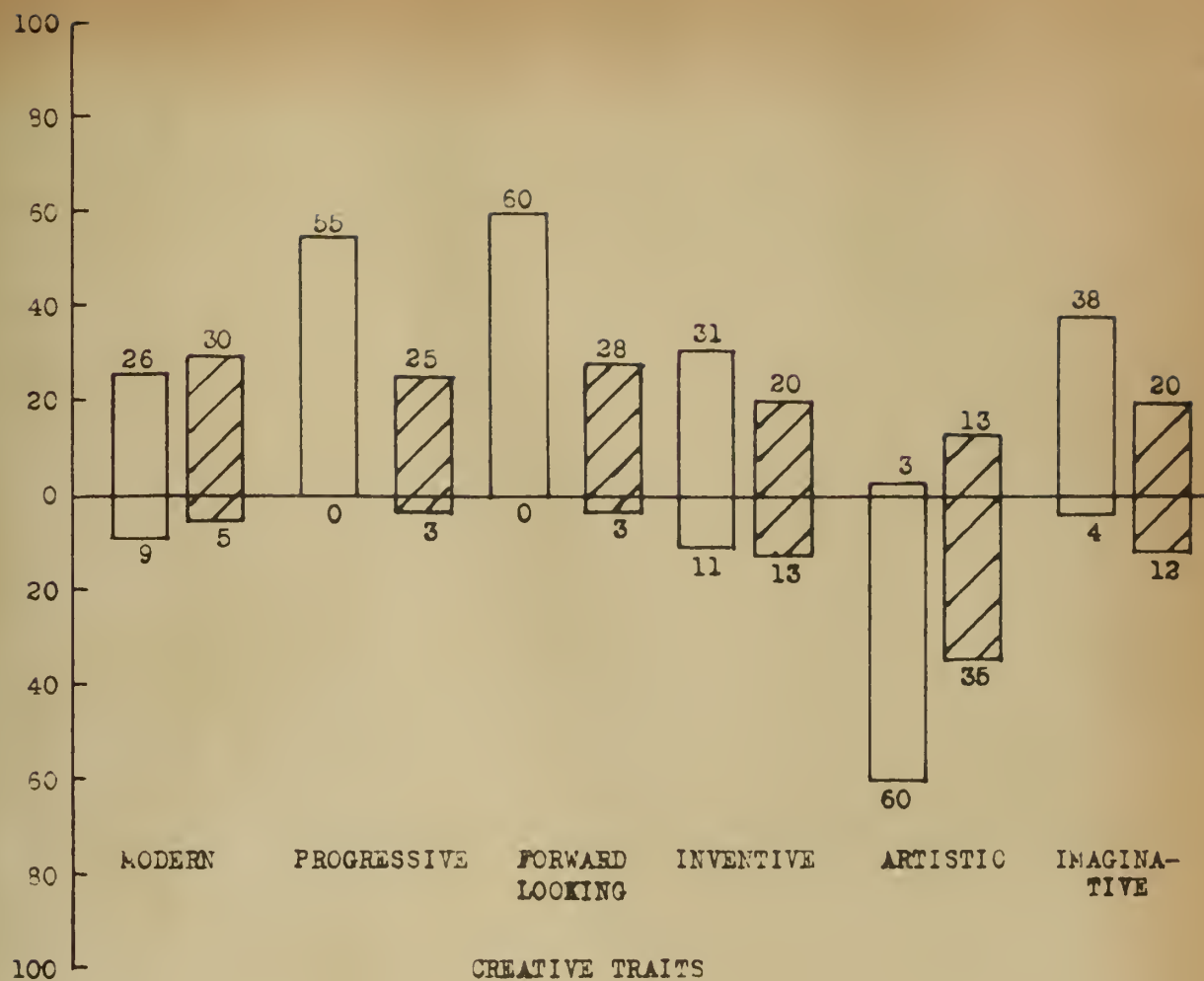


Fig. 3.—The Customers impression of Public Works Centers management compared with the image considered necessary by the CEC officer for the cooperative traits of management.



(Indicated in percent of total response)

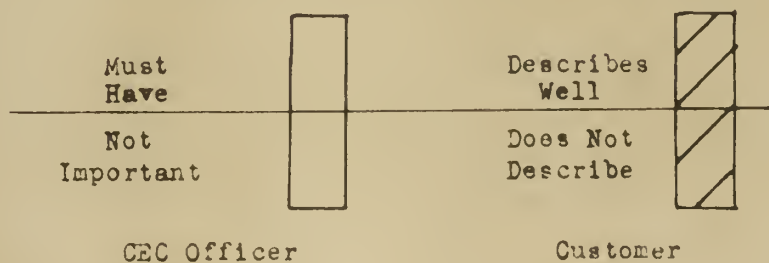


Fig. 4.--The Customers impression of Public Works Centers management compared with the image considered necessary by the CEC officer for the creative traits of management.

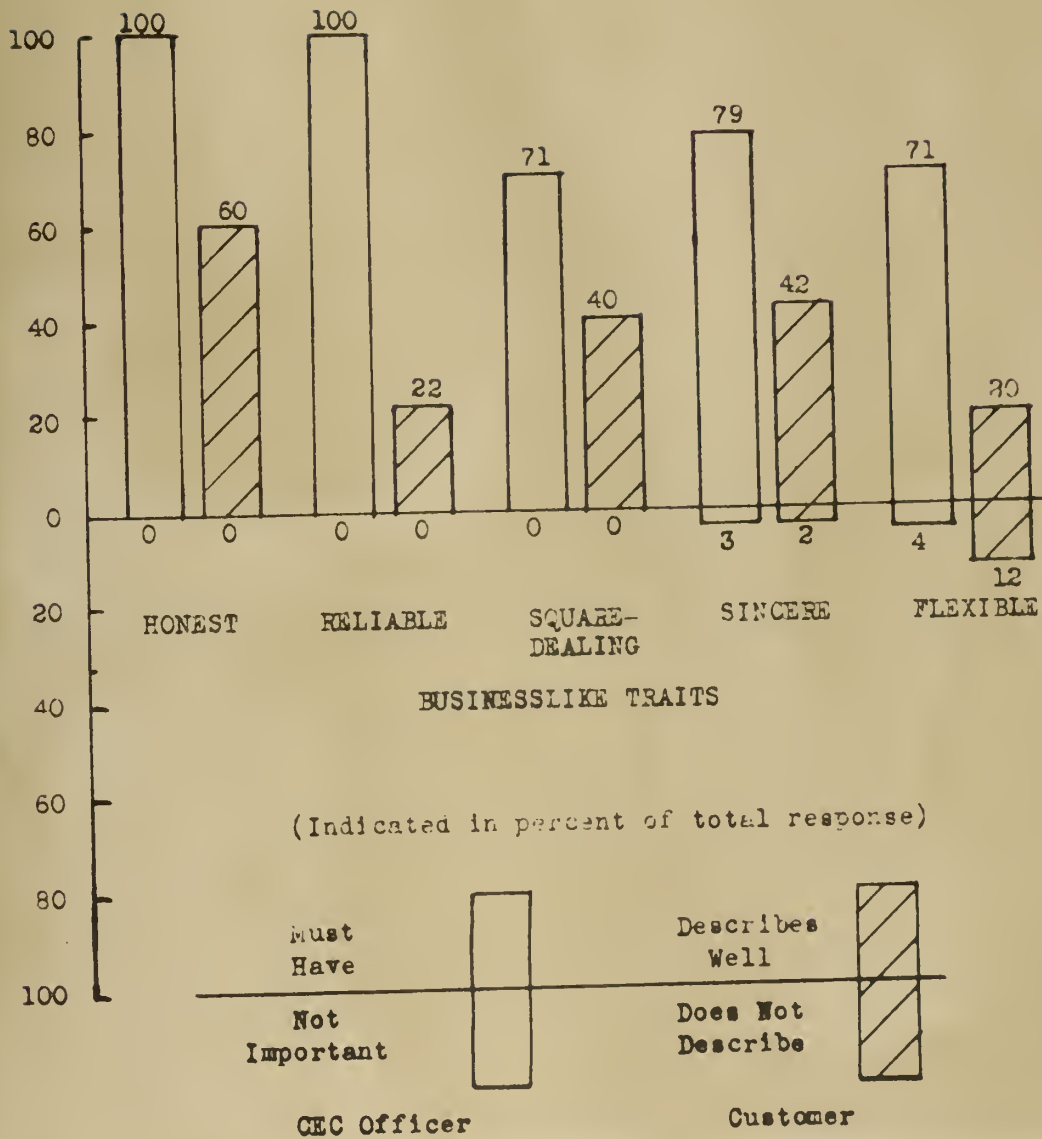
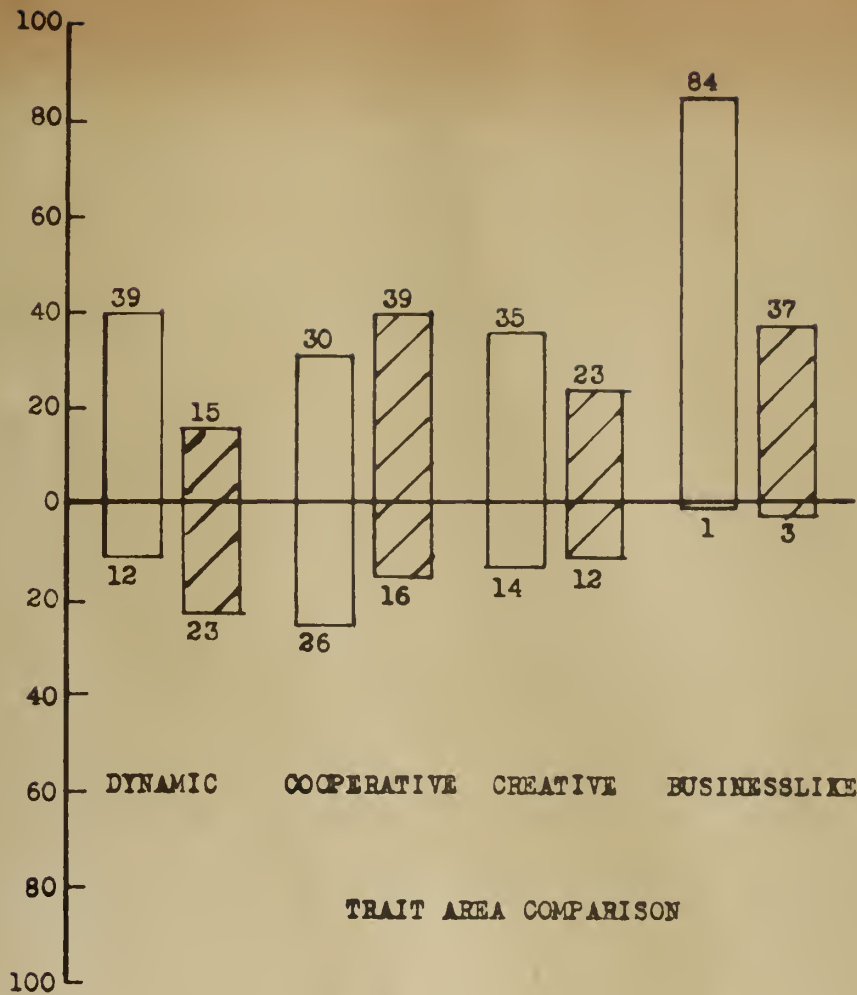


Fig. 5.--The Customers impression of Public Works Centers management compared with the image considered necessary by the CEC officer for the businesslike traits of management.



(Indicated in average percent of total response)

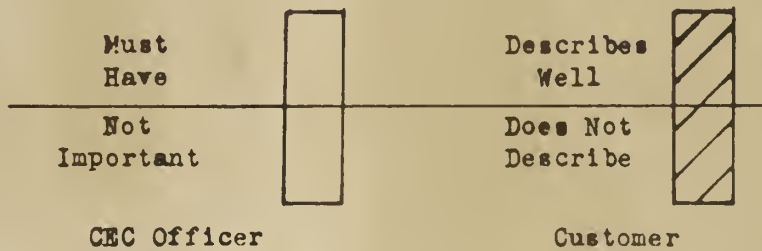


Fig. 6.—Comparison of views on management traits, customer and CEC officer.

Public Works Centers Viewpoint

The commanding officers of each of the Public Works Centers were requested to answer more detailed questionnaires.¹⁵ Responses were obtained from four of the six Centers. In addition to questions covering the minor service functions, the Public Works Centers were asked to answer the same questionnaire used to survey the CEC officers. To obtain the views of the operating people within the Public Works Center organization, portions of the questionnaires were directed to specific operating personnel. The questionnaires were devised to obtain facts concerning minor service operations, and opinions in the areas of reasonable service, reasonable charges, and the desirable image of a Public Works Center.

Opinion Survey Results

The surveys of the Public Works Centers again indicate the same similarity of opinion with the customers as to what is reasonable service, and reasonable charges. It was noted that Public Works Centers were considerably more interested in presenting a stronger image of public works management than the average CEC officer.

¹⁵ See Appendix III for format.

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Reasonable Service

Table VIII indicates clearly that the Public Works Centers management shares the opinion of the customer and the Civil Engineer Corps officers on reasonable delay in providing services.

TABLE VIII

RANGE OF MAXIMUM REASONABLE DELAY, CUSTOMER, CEC
OFFICER AND PUBLIC WORKS CENTERS COMPARED

Hours of Delay	Percentage of Service Items in Range		
	Customer	CEC	PW Center
0 - 1	17	19	15
0 - 2	34	31	33
0 - 4	53	52	51
0 - 8	65	66	69
0 - 24	90	81	84
0 - 48	90	90	93
0 - Over 48	100	100	100

Reasonable Charges

Table IX compares the opinion of the customer, CEC officer and PW Center regarding reasonable charges for services. Again the similarity of opinion is striking, particularly when the modes are compared.

The Public Works Centers Image

The Public Works Centers responses to the questionnaire

TABLE IX

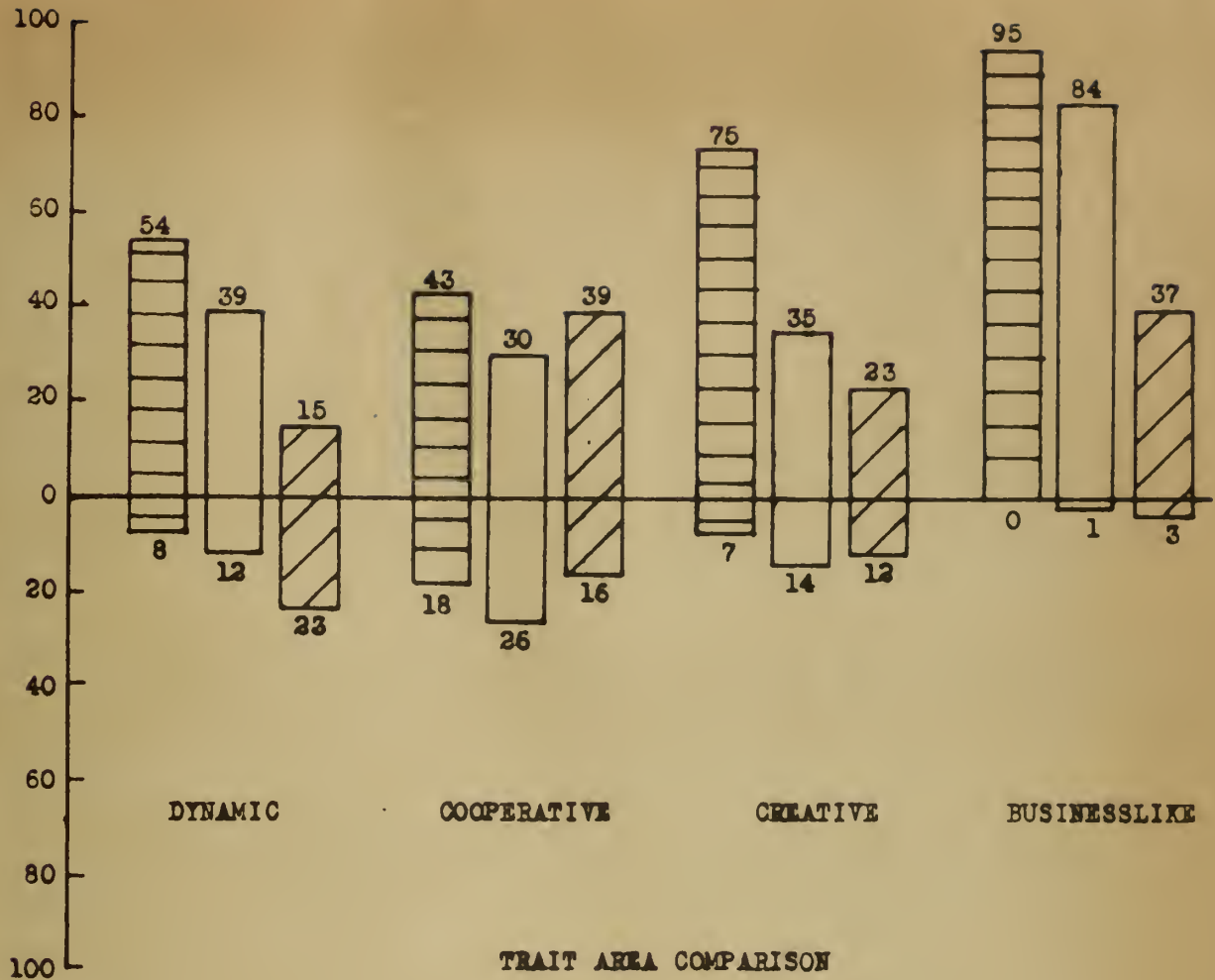
COMPARISONS OF OPINIONS ON REASONABLE CHARGE, CUSTOMER
CEC OFFICER AND PUBLIC WORKS CENTERS

Service or Work to be Performed	Maximum Reasonable Charge in Dollars						
	Mean			Mode			EPS*
	Cust.	CEC	PWC	Cust.	CEC	PWC	
Unstop plugged water closet	5.6	4.0	4.7	4.0	4.0	4.0	3.6
Replace fluorescent tube in office with 10' ceiling	3.5	4.0	4.0	2.0	4.0	2.0	3.3
Change a sedan tire on the road	4.2	4.5	4.3	4.0	4.0	4.0	4.0
Construct and install a 3' x 4' celotex faced bulletin board	18.0	14.1	17.6	16.0	16.0	16.0	18.1
Replace an electric wall outlet fixture	6.0	6.5	5.2	4.0	4.0	4.0	4.0
Repaint a metal office desk	17.8	19.0	17.0	16.0	16.0	16.0	3.6
Replace a washer in leaking faucet	3.5	2.4	2.6	2.0	2.0	2.0	2.3
Replace a 12" x 20" window glass	7.5	5.9	4.7	8.0	4.0	4.0	3.6
Install new night latch in wood door	7.5	6.3	7.0	8.0	4.0	8.0	7.2
Truck crane makes one 2000 lb. lift to flatbed trailer from ground (2-man rig)	8.4	17.8	12.5	16.0	16.0	16.0	17.1
Clean a 10' x 15' office	7.1	5.0	3.1	4.0	4.0	4.0	0.9
Mow a lawn, 100' x 200', walking power mower	10.3	7.8	8.3	8.0	8.0	4.0	9.8

*EPS includes 50% applied overhead on direct labor cost.

on image has been compared only on the basis of the aggregate traits or qualities expressed by the terms, dynamic, cooperative, creative and businesslike. It is evident from the response that the Public Works Centers are deeply aware of a need to present an overall forceful image to their customers. Figure 7 presents a comparison of the image strengths considered desirable by the customer, the average Civil Engineer Corps Officer and the Public Works Centers.¹⁶ It is apparent that if the general validity of an "image" survey is accepted, the managements of the Public Works Centers have some work to do. The customers and the Centers are in fair agreement as to image only in the area of the cooperative traits. It will undoubtedly be difficult if not impossible to improve the other three image strengths without actual management improvement. The impressions of the customers are in essence an expression of the customers view of Public Works Centers management. You can't "talk" the dynamic, creative, businesslike images and expect improvement. A higher impression rating in the minds of the customer will likely come only from an actual demonstration of the traits or qualities by the Public Works Center management.

¹⁶ The image survey of the Public Works Centers represents the opinions of the Senior Project Officer, or the Project Officers as a group. Included also is the expression of one Commanding Officer who voluntarily submitted his opinions on image. It is unfortunate from the standpoint of the survey that these respondents are the ones responsible for customer contact and should in general be the most highly motivated. A survey of the shops management may have been more enlightening.



(Indicated in average percent of total response)

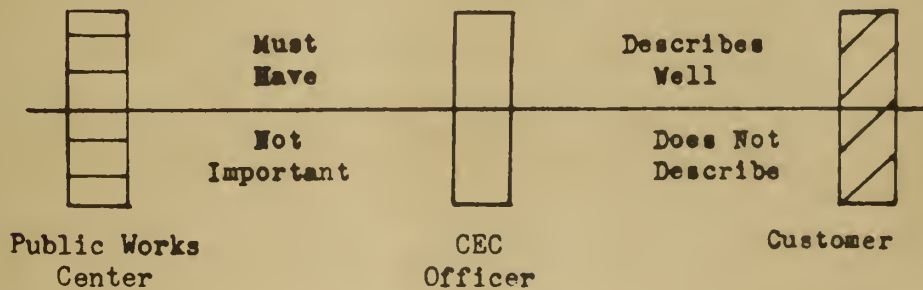


Fig. 7.--Comparison of views on management traits, customer CEC officer, and Public Works Center.

Summary

This chapter has perhaps become overlong, because of a desire to look at the implications of the field surveys. The high response rate indicates an interest in the basic questions posed:

1. What is reasonable service?
2. What is a reasonable charge for service?
3. What service image have the management of Public Works Centers presented to their customers?

The customer has stated that to have "reasonable service," fifty per cent of the listed minor service calls should be answered within four hours of the call for assistance. The customer also expects ninety per cent of the listed service calls to receive attention within forty eight hours or two days. On the surface the customer may appear to be "unreasonable" in his views, however the Civil Engineer Corps Officers surveyed concur with the customers views on reasonable service, and it appears to be in the best interest of public works centers management to strive towards the criteria established. In light of the "not past the second day rule" of the civilian firms surveyed the opinions of the customer and CEC officer do not appear to be out of line.

The surveys on reasonable charges again indicated a striking similarity of opinion between customer, CEC officers,

and Public Works Centers, as to what is a reasonable charge for a service. It seems apparent that if the direct services can be performed within the times established by the Engineered Performance Standards, and the applied overhead rate is maintained as close to fifty per cent as possible, the customer would feel the charges were reasonable most of the time.

It may be inferred from the image surveys that the Public Works Center managements have not overly impressed their customers with a dynamic, creative, businesslike approach to getting the job done.

CHAPTER IV

CONCLUSIONS

CHAPTER IV

CONCLUSIONS

Satisfactory Service

By inference there is little doubt that "all hands," the customer, the CEC officer and Public Works Center managements are in fair agreement as to what constitutes reasonable service in terms of response and cost. If the criteria of reasonable service delay that has been inferred is valid, then we can examine average response as reported by the Public Works Centers and have some means of measuring whether the service is satisfactory in terms of response at the present time.

In like manner, if the costs of performing the minor services were no greater than the estimates prepared using Engineered Performance Standards and a fifty per cent applied overhead rate, it can be inferred that the customer would consider the majority of the charges to be reasonable. To obtain information on the actual costs of services is beyond the scope of this thesis, therefore, the criteria for "cost reasonableness" will be to perform the service within the Engineered Performance Standards and to strike for a goal of no more than a fifty per cent applied overhead rate for the minor services.

Is the Actual Response Reasonable?

The Public Works Centers were asked to indicate their backlog for minor job orders and emergency service work, and the average age of service requests in these two areas. The response would lead one to believe that, of the Centers returning questionnaires, none has a clear understanding of the magnitude of its service work in terms of backlog, or measures as a practice the average age of the outstanding service requests.¹ This lack of information on service work is due in part to a faulty questionnaire. However, when an activity reports that its backlog of work is two shop days and reports that the average age of its outstanding emergency/service requests is forty eight hours, the response is subject to question. Another Center stated its backlog of emergency/service work as five shop days, but stated the average age of its service requests was twenty four hours. Another Center reported no backlog of emergency/service requests, but stated the average age of the requests was six hours. From the response it is doubtful that the Public Works Centers are answering fifty per cent of their

¹Service work includes the minor job orders and the emergency/service work. The four Center respondents reported that the ceiling for minor job orders was in the range of forty to eighty hours, and emergency/service work had a ceiling imposed by management of sixteen to twenty four hours. Hours are expressed as manhours expended, not hours involved from start to finish of job, using the ordinary time scale.

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calls within four hours, or answering ninety per cent of the calls within two days. A failure on the part of the writer to appreciate the statistical difficulty in analyzing the minor service problem makes it necessary to attack the problem on a general basis. It was intended by the writer that sufficient information would be developed to enable the construction of a valid model, using "operations research" techniques. The model should represent as closely as possible the actual service operation. The problem involved in providing the personnel, equipment, and materials, to perform a variety of tasks, in various locations is a special application of the "waiting-line model."

Model Building

Waiting-line models constitute a separate sub-class of inventory problems where it is necessary to keep a supply of capabilities to meet future demand. In the construction of waiting-line models it has been stated that:

All of them are developed in terms of two measureable quantities: (1) The arrival rate of the things or persons to be serviced and (2) The service rate at the facility. The service rate is commonly called the departure rate, since at the conclusion of the service the thing or person departs from the facility. Both of these rates can be directly measured

by an observer with a stop watch or some suitable recording device.²

In the case of emergency/service work the arrival rate would be the receipt of the service call or service request. The departure rate would be calculated at the conclusion of the service. Information should be available to calculate both the arrival and departure rates and to determine the ratio of arrival rate to departure rate, in order to determine the behavior of the waiting lines. Miller and Starr point out that:

Two of the more important measures of the behavior of the process are (1) the average number of things or persons in line waiting for service and (2) the average waiting time required in order to get service.³

"The average waiting time required in order to get service" corresponds directly to the term "delay in hours before a serviceman arrives." At first glance it appears as if there might be a stock solution to the emergency/service problem. Unfortunately this is not the case. The authors continue:

The great variety of models that exist is required to handle all the variants of the fundamental waiting-line process that occur in practice. Some of the major variants are:

1. Different probability distributions for arrivals

²David W. Miller and Martin K. Starr, Executive Decisions and Operations Research, (Englewood Cliffs, N. J.: Prentice-Hall Inc., 1960), p. 397.

³Ibid.

2. Different probability distributions for service times
3. Number of facilities
4. Servicing order
5. Waiting-line discipline
6. Priorities⁴

In applying the variants listed we note that except for Item 5 the variants all apply to the emergency/service work. The authors do not claim that their list is all inclusive and this is fortunate, for in the emergency/service model it is necessary to add another variable, probability of skill availability. Miller and Starr point out that it is possible through either mathematical analysis or the "Monte Carlo" method to determine the average waiting time under the various conditions.⁵ The six variants in the emergency/service model place the process beyond the scope of this thesis. Miller and Starr have further observations that are pertinent:

For any given number of facilities [capabilities] the average waiting time can be determined. Given the cost per unit of waiting time and the cost of operating each facility [capability], it is then simple to find the cost for each number of facilities [capabilities]. The minimum such total cost then determines the optimal number of facilities.

. . . Generally the cost of operating the facility [capability] is obtainable from accounting

⁴Ibid.

⁵The Monte Carlo method is based on using model samples, calculation of the probability for each variant, and by the use of random numbers tables determining the outcome of the alternatives. A complete description of the process can be found in Miller and Starr, loc. cit., p. 152.

data, which also may yield the waiting-time cost. However in many cases where the waiting line consists of prospective customers it is difficult, or virtually impossible, to estimate the waiting-time cost. The possible cost of loss of customer good will is a major component which can only rarely be determined. However in the cases where the waiting-time cost cannot be estimated it is still possible to provide the decision-maker with the average waiting-time that will result for any selection of number of facilities [capabilities]. This provides him with a quantitative basis for exercising his judgement as to acceptable waiting times The necessary techniques are well developed and relatively easy to apply to specific problems, and to unrealistic assumptions or data requirements are involved. Further, waiting-line behavior is often contrary to an inexperienced intuition, so it is not easy to find the optimal strategy by judgement alone.⁶

It is apparent that the construction of a "model" of the emergency/service problem with its variants would be helpful in order to be in a position to predict waiting times for a basis of decision-making. To some extent the use of a model is limited because of the customer relationship, but its use should not be totally discounted. Use of the model also has the advantage of not disrupting work to test various methods of performing the work.

Feedback

One of the fundamental elements in any control system is feedback. In any ongoing organization the situation is

⁶Ibid., p. 399.

constantly changing. In the emergency/service model discussed above the effect of the variations was noted. Once decision rules are established for a unit it is necessary to arrange a means of monitoring the output of the unit to determine if the unit is functioning in accord with the instructions provided. If management is to really control the minor service function then some means of feedback is necessary. Feedback can in this instance generate from two sources, from the customer in the form of a complaint, or from some form of management advice concerning the input-output relationship. The reporting unit for feedback control in the emergency/service area could well be one job. The similarity shown between the mix of job lengths at the four major Centers makes this reporting unit susceptible to Center-wide comparisons. At the present time there appears to be no customer feedback device for the emergency/service function. In waiting-line problems it was pointed out that one important element was average waiting time. Although the questionnaire failed in obtaining positive information on feedback, it was apparent that a system to measure the "average waiting times" is in general lacking. A feedback system for emergency/service functions should have a positive means for customer feedback, and a system which portrays the input and output, and shows the average waiting time. If decision rules based on model studies were available it would be possible to

predict rather accurately the delay times for service calls, allowing the customer to be advised of the expected waiting time. The same system would also keep management abreast of the constantly changing workloads and allow adjustments to be made as required.

Reasonable Charges

It appears from the survey data that the customer, the CEC officer and the Public Works Center management have similar ideas as to what constitutes a reasonable cost. It has been demonstrated however that as the overhead rate goes up towards one hundred per cent of direct labor cost, the charge has less chance of being considered reasonable by any of the respondents. Under current billing procedures the emergency service work is being billed on the basis of direct labor, direct material, and using the same applied overhead rate as the remainder of the maintenance department.⁷ Applying across the board overhead rates for the minor services tends to inflate the charges for minor services perhaps unnecessarily. The minor services require little support in the area of planning and estimating or in special material support. Perhaps the unfortunate circumstance in the billing is that in accordance with the

⁷U.S., Department of the Navy, Navy Industrial Fund Handbook for Public Works Centers, NAVEXOS P-1718, April 1957, par. 5203-2, p. 5-11.

accounting practice established it is necessary to bill " . . . for the actual costs of direct labor, direct material, other direct charges, and applied expenses recorded on Customer Cost Summaries" ⁸ The exception to billing for actual costs is allowed for certain functions such as sanitation services, and "when a firm price order has been mutually agreed to," ⁹ Information provided during an interview with Mr. Lowery of the Bureau of Yards and Docks indicates that from all appearances an excessive amount of accounting is being performed by charging for the actual cost of each minor job. Table X has been developed from Figure 8 and shows the variation in job length for the minor emergency/service jobs involving less than sixteen man hours to complete. ¹⁰

Table X shows clearly that fifty five per cent of the minor jobs are completed in two hours or less, yet the same basic accounting system is followed for labor distribution and material as the system used in a \$25,000 job. To record the labor and material transactions for each job is at least a thirty one step process. ¹¹ The exact cost to record the

⁸Ibid.

⁹Ibid., par. 5213, p. 5-16.

¹⁰Figure 8 provided by Mr. H. K. Lowery, Shore Establishment Division, Bureau of Yards and Docks, during an interview on 29 March, 1961.

¹¹Navy Industrial Fund Handbook . . . , op. cit., pp. 6-21 and 7-4.

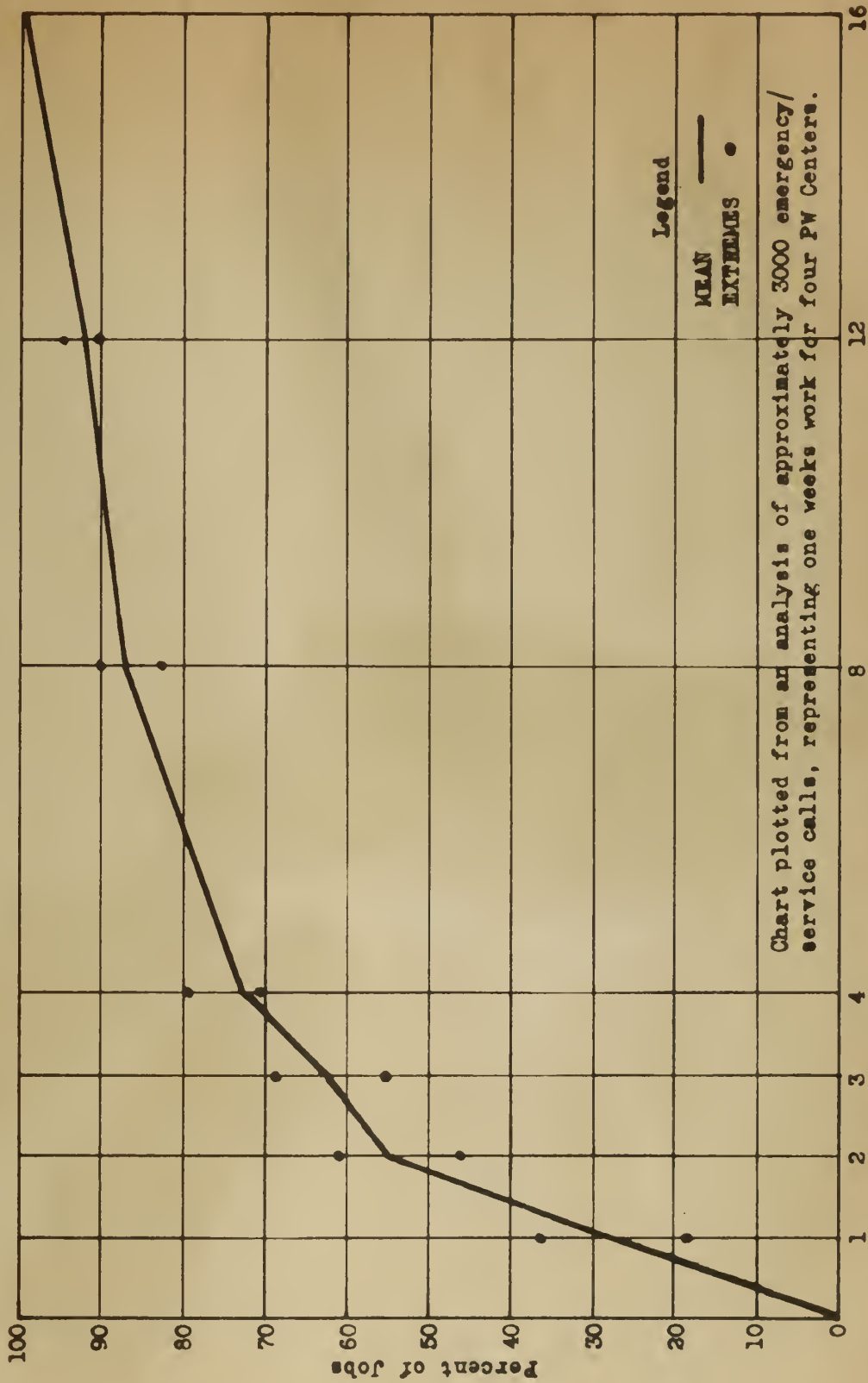


Fig. 8.--Variation in Job Length for Emergency/Service Work at Public Works Centers.

accounting information is not known. For purposes of discussion let us assume that each step takes one minute. One minute is probably ridiculously low, however on this basis it would take thirty one minutes to record and perform the billing operation. If direct clerical and supervisory labor were paid at the rate of \$2.00 per hour, and with office supervision, office space and machine time included in the overhead on clerical work, the cost would be at least fifty per cent more or \$3.00 an hour. The cost of accounting (using what appears to be low estimates of cost) for a job with only one labor entry and one material entry is probably at least \$1.50. The question might be asked, how can this accounting charge be reduced.

TABLE X

DISTRIBUTION OF MINOR JOBS BY
MAN HOURS, FOUR CENTERS

Man Hours per Job	Frequency of Jobs
1	29
2	26
3	8
4	9
8	15
12	4
16	<u>9</u>
	100

Substitute Billing Procedures

The Bureau of Yards and Docks and the Public Works Centers have investigated using flat time charges to include

labor and material, and a standard charge for a particular type of service. In the first instance the direct labor time would be kept, however, in billing only one rate would be applied and this rate would include a charge for materials based on a statistical average cost per job. The second method proposed would develop a standard charge for fixing a faucet washer, or replacing a wall outlet, and again would include direct and indirect charges. The one minor disadvantage of the first proposal is that you are still accounting for a job in terms of actual labor time requiring a calculation of cost for each job unless it would be possible to accumulate total hours for each customer and bill monthly on the basis of a summary sheet similar to the sanitation charges. The second method requires the development of "flat rate standards" which would be subject to individual questioning on validity because of distance, individual difficulty, etc. A third method suggests itself when the data in Figure 3, is analyzed.

Inductive Accounting

Figure 8 shows the variation in job length for emergency service work at four major Public Works Centers. For the sampling period of one week the variation in the mix of job lengths at the various centers appears negligible. On the basis of the data shown in Figure 8 it seems feasible to use a

form of statistical billing to charge the customers. M. J. Slonin reports that in the intercompany billing process for railroads and airlines reimbursement is obtained in many instances on the basis of statistical samples.¹² An example used by Mr. Slonin to demonstrate the application of statistical billing for railroads is cited:

Stratum	Waybill Freight Charge	Population Total Number of Waybills	Sample Size
1	Less than \$5.00	3,673	186
2	\$5.00 to \$ 9.99	818	72
3	\$10.00 to \$ 19.99	395	82
4	\$20.00 to \$ 39.99	119	51
5	\$40.00 and over	<u>42</u>	<u>42</u>
	Total	5,046	433

In the particular example cited, the estimated share cost from the sample was \$11,950, and the actual share cost calculating each bill separately was \$11,793, "a difference of only \$157 out of nearly \$12,000."¹³

For the sample of one hundred jobs shown in Table X it would be necessary to charge the customer for 4.53 manhours per call, unless a stratified sample was used. Using stratified

¹²M. J. Slonin, Sampling in a Nutshell, (New York: Simon and Schuster, 1960), pp. 110-116.

¹³Ibid., p. 112.

sampling techniques, the costs for the minor jobs of two hours or less would not be inflated, by the fewer but more time consuming jobs closer to sixteen manhours each.

The process reported deserves consideration however as a means to reduce accounting costs, and should be acceptable to the government as airlines and railroads are under rather rigid government regulation because of their special monopoly character. Mr. Slonin stated:

Few things impress the disbeliever in sampling as much as the news that large, solvent organizations regularly exchange impressive sums of money on the basis of very modest samples. This sample method of payment is called "inductive accounting" by the participating carriers and has been operating successfully since February 1956.

Whenever a passenger trip involves travel on two or more airlines it is necessary to split the take among the carriers who did the haulings. Conventional accounting methods that are used to allocate the lucre require the complete processing of every ticket; while the sample technique entails the tally of only a relatively small number.

To indicate the importance of the sampling approach, it is noted that:

1. Annual airline billings between two typical large airlines exceed \$20,000,000.
2. The sample used to estimate these billings averages 12 per cent of the inter-line tickets.
3. The cumulative sampling errors have been running less than one tenth of one per cent, and are acceptable to both internal and public auditors.

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4. Clerical savings resulting from the sampling application can exceed \$15,000 annually for any one of the large carriers¹⁴

It seems reasonable to assume that if private concerns in a well regulated industry can operate successfully with "inductive accounting" on intercompany billing, that the Navy should be able to pursue a similar course and reduce its overhead costs when it is operating from a single appropriation for Operations and Maintenance.

Summary

The concept of providing public works services from one organizational unit within a large naval complex is an integral part of the established policy of the Department of the Navy. The reduction of the cost of the public works function by elimination of the duplication of public works shops, equipment, and other overhead is not only necessary, but essential if the Navy is to have funds for the newer weapon systems. The basic directives establishing the Public Works Centers have been supplemented by the statements of the Chief and Deputy Chief of the Bureau and Yards and Docks and provide the basis for a dynamic public works organization. A dynamic public works organization is mandatory. The customers of the Public Works

¹⁴Ibid., p. 113.

Centers are subject to many internal and external pressures and are looking for someone to relieve them of their problems in the public works area. A dynamic public work organization is the only one that can provide this type of customer support.

It has been indicated that perhaps the customers of the Public Works Centers are not unreasonable in their requests. The surveys indicate that the average Civil Engineer Corps officer shares the opinion of the customer as to what constitutes "reasonable service" and "reasonable charges." The image survey conducted indicates that the management of Public Works Centers cannot yet afford to relax their efforts to establish their "niche" in the society of naval shore activities. As indicated by the Deputy Chief of BuDocks, the "niche" will be won by doing " . . . a job cheaper, better, and faster than anyone else" ¹⁵

A review of some of the more modern management literature indicates that there is a possibility that the complex problems of managing the minor service functions can be handled by "operations research" techniques, and further that there are reliable and acceptable accounting procedures that will assist in eliminating unnecessary overhead costs.

¹⁵Captain P. Corradi, loc. cit.

APPENDIX I
CUSTOMER SURVEY

List of Naval Activities Surveyed (Customers)**NEWPORT AREA (10 Activities)**

- U.S. Naval Station
- U.S. Naval School, Naval Justice
- U.S. Marine Barracks
- Fleet Training Center
- U.S. Naval Communication Station
- U.S. Naval Hospital
- U.S. Naval Underwater Ordnance Station
- U.S. Naval Supply Depot
- U.S. Naval Degaussing Station
- U.S. Naval Magazine and Net Depot

NORFOLK AREA (12 Activities)

- U.S. Naval Communication Station
- U.S. Naval Degaussing Station
- U.S. Naval Dental Clinic
- U.S. Naval Dispensary
- Fleet Training Center
- U.S. Naval Station
- U.S. Naval Receiving Station
- U.S. Naval Schools Command
- U.S. Marine Barracks
- U.S. Naval Air Station
- U.S. Naval Supply Center
- U.S. Atlantic Fleet ASW Tactical School

PEARL HARBOR AREA (10 Activities)

- U.S. Naval Submarine Base
- U.S. Naval Station
- U.S. Naval Reserve Training Center
- Camp H.M. Smith, USMC
- Inactive Service Craft Facility
- District Public Works Officer, 14th N.D.
- Fleet Training Center
- Fleet Weather Central
- U.S. Naval Air Station, Ford Island
- U.S. Naval Ammunition Depot

List of Naval Activities Surveyed (Continued)**GUAM AREA (8 Activities)**

- U.S. Navy Dental Clinic
- U.S. Naval Hospital
- U.S. Naval Station
- U.S. Naval Supply Depot
- U.S. Naval Ship Repair Facility
- U.S. Naval Magazine
- U.S. Naval Communication Station
- U.S. Naval Air Station, Agana

SUBIC BAY AREA (6 Activities)

- U.S. Naval Air Station Cubi Point
- U.S. Naval Supply Depot
- U.S. Naval Ship Repair Facility
- U.S. Naval Communication Facility
- U.S. Naval Station
- U.S. Naval Magazine

GUANTANAMO BAY (6 Activities)

- U.S. Naval Station
- U.S. Naval Hospital
- U.S. Naval Air Station
- U.S. Naval Supply Depot
- Fleet Training Group
- U.S. Marine Barracks

TABLE 1. SUMMARY OF DATA FOR 1962

Summary of Data for 1962

1. Total number of birds	1,000
2. Number of birds seen	1,000
3. Number of birds heard	1,000
4. Number of birds seen and heard	1,000
5. Number of birds seen but not heard	1,000
6. Number of birds heard but not seen	1,000
7. Number of birds seen and heard but not counted	1,000
8. Number of birds seen and heard but not counted	1,000

Summary of Data for 1962

1. Total number of birds	1,000
2. Number of birds seen	1,000
3. Number of birds heard	1,000
4. Number of birds seen and heard	1,000
5. Number of birds seen but not heard	1,000
6. Number of birds heard but not seen	1,000
7. Number of birds seen and heard but not counted	1,000
8. Number of birds seen and heard but not counted	1,000

Summary of Data for 1962

1. Total number of birds	1,000
2. Number of birds seen	1,000
3. Number of birds heard	1,000
4. Number of birds seen and heard	1,000
5. Number of birds seen but not heard	1,000
6. Number of birds heard but not seen	1,000
7. Number of birds seen and heard but not counted	1,000
8. Number of birds seen and heard but not counted	1,000

Sample of Letter Sent to Customer Activities

Captain John A. Doe, USN
Commanding Officer
U.S. Naval Station
Pearl Rocks, Rhode Island

Dear Captain Doe:

I am assigned at George Washington University as a student in the Navy Post Graduate Comptrollership Program. To complete the program students are required to submit a formal thesis. "Organization for Minor Service Functions at Public Works Centers," is the subject I have selected. The subject is not a glamorous one, but does interest CEC officers.

It seems essential that the opinions and needs of the customers must be considered in any study of Public Works Centers, if the study is to be objective. Your activity is listed as a customer of a Public Works Center, and therefore your opinions of customer needs will be of great value. It is recognized that activities are constantly bombarded with requests for information. In the interest of brevity, the attached questionnaire has been prepared so that it can be effectively completed in about 15 minutes without reference to any records. The opinions of the Commanding Officer or department head would be most valuable, however the questionnaire can be completed by any member of your command familiar with the needs of your activity in the Public Works area.

To maintain objectivity, none of the activities will be identified with a particular Public Works Center. A self-addressed envelope has been provided for the return of the questionnaire to maintain anonymity. The University does not maintain a student postal service, therefore it is necessary for me to use my home address. My official status can be verified by reference to the Naval Register, or the Civil Engineer Corps Directory, NavDocks P-1. The CEC Directory is available from any CEC officer.

Like most students, we are working under a tight schedule. The completion and return of the questionnaire will be greatly appreciated.

Very respectfully,

s/ Charles E. Diehl

Charles E. Diehl
LCDR, CEC, USN

THE HISTORY OF THE UNITED STATES OF AMERICA

The first part of the history of the United States is the period from the discovery of the continent by Christopher Columbus in 1492 to the establishment of the first permanent settlements in 1607. This period is characterized by the exploration of the continent by Spanish, French, and English explorers, and the establishment of the first permanent settlements in the eastern part of the continent.

The second part of the history of the United States is the period from 1607 to 1776. This period is characterized by the growth of the colonies, the struggle for independence from Britain, and the establishment of the United States as a new nation. The colonies were established by English, French, and Dutch settlers, and they grew into a powerful nation that was able to win its independence from Britain in 1776.

The third part of the history of the United States is the period from 1776 to 1865. This period is characterized by the American Revolution, the War of 1812, and the Civil War. The American Revolution was a struggle for independence from Britain, and the War of 1812 was a conflict between the United States and Britain. The Civil War was a conflict between the Union and the Confederacy, and it ended in 1865 with the Union's victory.

The fourth part of the history of the United States is the period from 1865 to the present. This period is characterized by the Reconstruction era, the Gilded Age, and the Progressive Era. The Reconstruction era was a period of rebuilding the South after the Civil War, and the Gilded Age was a period of rapid industrialization and economic growth. The Progressive Era was a period of social and political reform.

This questionnaire has been prepared so that general opinions, trends, and comparisons can be evaluated. It is not necessary to make a studied reply to any part of the questionnaire. Pencil is fine.

Please indicate the services provided for your activity by the PWCEN:

Provides all PW services ____ Furnish Utilities ____ Operate Utilities ____
 Major Building Maintenance ____ Minor Maintenance of Bldgs. ____
 Janitorial ____ Groundskeeping ____ Troublecall ____ Trash & Garbage
 Collection ____ Engineering ____ Transportation Maintenance ____
 Transportation Operation ____ Other _____

Please proceed to the following pages, if after completing this questionnaire you wish to make any other comments, they can be noted below.

NOTE: This part of the questionnaire did not serve the purpose intended as it lacks clarity of intent. It did serve as a check to insure that the activity was served by the adjacent Public Works Center.

WHAT IS REASONABLE SERVICE?

The following list of minor work items contains some of the most frequent service or trouble-calls received by Public Works organizations. Please check the column that indicates the maximum delay in hours that you consider reasonable under normal conditions, before someone arrives to start work, after a call has been placed.

Type of Service

Maximum Reasonable Delay in Hours
Before Serviceman Arrives

	No Answer	1	2	4	8	24	48	Over 48
Washbowl Stopped-up	0	4	14	15	3	2	2	-
Air-conditioner in office is out	1	2	9	12	21	11	3	1
Window won't open	2	0	3	9	5	12	5	4
Head is out of paper towels	7	11	8	10	3	-	-	1
Electric Cord on office machine shorted	1	11	15	8	3	3	-	-
Shower Head is leaking	-	-	4	5	3	10	3	5
VIP's coming, grass needs cutting	6	2	2	3	8	10	5	4
Need a small sign manufactured	-	-	1	-	1	7	10	21
Broken window glass	1	1	4	6	8	12	4	4
Need operations board hung on wall	3	-	1	-	7	2	11	16
Scuttlebutt out of order	1	-	10	8	9	9	2	1
Guard truck stalls on road	-	27	8	3	1	1	-	-
Reefer in galley goes out	1	26	9	3	-	1	-	-
Main road has bad chuck hole	5	-	1	3	2	12	7	10
Cooking gas odor noticed in quarters	9	22	5	2	1	-	1	-
Ladies toilet needs cleaning	4	7	3	10	7	6	2	1
Typewriter needs repairs	4	2	2	3	4	9	8	8
File cabinet drawer stuck	2	2	8	10	8	3	6	1
Warehouse door is off track	6	3	9	16	4	1	1	-
Steam radiator is leaking	4	4	10	11	5	4	2	-
Totals	56	124	126	137	88	115	77	77

CUSTOMER TABULATION

WHAT IS A REASONABLE CHARGE FOR SERVICES?

For the following list, please indicate what you think is the maximum reasonable charge for performing the service or work indicated. Consider for purposes of similarity that the point of work is not over one mile from the Public Works Facility, and that skilled labor is paid about \$3.00 per hour. Reasonable charge should include basic labor, material, and allowance for overhead.

Service or Work to be Performed	Maximum Reasonable Charge in Dollars						
	1	2	4	8	16	32	Over 32
Unstop plugged water closet	1	11	15	6	5	-	-
Replace fluorescent tube in office with 10' ceiling	8	13	11	5	1	-	-
Change a sedan tire on the road	3	10	16	3	2	-	-
Construct and install a 3' x 4' celotex faced bulletin board	-	-	2	8	18	4	5
Replace an electric wall outlet fixture	1	6	16	11	4	-	-
Repaint a metal office desk	-	-	1	12	14	7	4
Replace a 12" x 20" window glass	-	2	15	16	3	1	-
Replace a washer in leaking faucet	9	13	12	2	2	-	-
Install new night latch in wood door	-	4	11	15	6	-	-
Truck crane makes one 2000 lb. lift to flatbed trailer from ground (2-man rig)	-	-	7	6	13	4	5
Clean a 10' x 15' office	2	3	16	12	2	1	1
Mow a lawn, 100' x 200', walking power mower.	-	2	4	20	7	2	1

WHAT IS YOUR IMPRESSION OF THE PUBLIC WORKS CENTER MANAGEMENT?

The following list expresses to varying degrees the traits found common to many organizations. Please place a check in the column to the right, your evaluation of the PWCenter that is serving you.

(Replies indicated in Per Cent)

Traits	Describes Well	Partially Describes	Does Not Describe
Alert	25.0	65.0	10.0
Open-minded	35.0	50.0	15.0
Modern	30.0	65.0	5.0
Progressive	25.0	72.5	2.5
Forward Looking	27.5	70.0	2.5
Imaginative	17.5	65.0	17.5
Inventive	20.0	67.5	12.5
Artistic	12.5	52.5	35.0
Lively	7.5	67.5	25.0
Eager	20.0	65.0	15.0
Vigorous	15.0	70.0	15.0
Enterprising	15.0	67.5	17.5
Venturesome	2.5	72.5	25.0
Cheerful	57.5	32.5	10.0
Friendly	77.5	20.0	2.5
Kindly	32.5	47.5	20.0
Charitable	17.5	42.5	40.0
Public-spirited	27.5	67.5	5.0
Honest	60.0	40.0	-
Reliable	22.5	67.5	10.0
Sincere	42.5	55.0	2.5
Square Dealing	40.0	60.0	-
Modest	27.5	55.0	17.5
Flexible	20.0	67.5	12.5

APPENDIX II

CEC OFFICER SURVEY

Civil Engineer Corps Officer Survey

The following survey was sent to 106 CEC officers in the grade of Lieutenant through Captain. Randomness was achieved through the CEC Directory page numbers and the lineal position on the page, using the first four digits of a Random Numbers Table. In the event that the position on the page was filled by an officer senior (one Rear Admiral did turn up) or junior to the desired grades, the next number was used from the Table. In like manner, as there are only 39 pages in the front of the 1 October 1960 Alphabetical Directory Listing, numbers higher than 39 were discarded.

THE HISTORY OF THE UNITED STATES

The following history was sent to the printer in

the month of November, 1840, and was published in

the month of January, 1841, and was published in

the month of March, 1841, and was published in

the month of May, 1841, and was published in

the month of July, 1841, and was published in

the month of September, 1841, and was published in

the month of November, 1841, and was published in

the month of January, 1842, and was published in

the month of March, 1842, and was published in

Sample of Letter Sent to RandomlySelected CEC Officers

LCDR John A. Bones, CEC, USN
Public Works Officer
U.S. Naval Activity
Jones Beach, Washington

Dear John:

How many times in your career have you listened to gripes that went something like this: "Boy, that organization of yours is sure something! I had to call three times yesterday to get someone to open a stuck desk drawer. Finally, not one but two men showed up, two men just to open one desk drawer. Why if I had had a screwdriver, I could have finished the job myself in about two minutes. Boy, what an organization!" About this time you are wishing for a screwdriver yourself, because you have a little job you would like to do. However, the fact that your friend couldn't get at his copy of Sports Illustrated when he wanted to, didn't change the minor service problem. As a student at George Washington University in the Comptrollership course, I have to submit a thesis. It is my intent to study the minor service problem in Public Works organizations. To complete my study I need your assistance.

As the thesis is supposed to be my research paper, and not yours, I have attempted to keep the questionnaire as short and simple as possible. It will take less than 15 minutes to obtain your opinion and help in bringing definition to the following three areas:

- (1) What is reasonably responsive service?
- (2) What is a reasonable charge for minor services?
- (3) What traits are involved in creating the best "service" image for a Public Works Organization?

In order to keep the number of people involved in answering the questionnaire to a minimum, a random sampling technique has been used to select your name. It will be appreciated if you will pick up your pencil at the first opportunity, complete the questionnaire, and return it in the envelope provided.

Thanks very much.

Sincerely,
s/ Charlie

Charles E. Diehl
LCDR, CEC, USN



CEC Tabulation

WHAT IS REASONABLE SERVICE?

The following list of minor work items contains some of the most frequent service or trouble-calls received by Public Works organizations. Please check the column that indicates the maximum delay in hours that you consider reasonable under normal conditions, before someone arrives to start work, after a call has been placed.

Type of Service

Maximum Reasonable Delay in Hours
Before Serviceman Arrives

	1	2	4	8	24	48	Over 48
Washbowl Stopped-up	10	21	35	7	4	1	-
Air-conditioner in office is out	6	10	17	15	19	10	3
Window won't open	1	3	11	12	23	17	9
Head is out of paper towels	26	18	23	6	3	2	-
Electric Cord on office machine shorted	27	23	17	6	3	1	1
Shower Head is leaking	3	3	9	16	20	16	11
VIP's coming, grass needs cutting	4	5	13	19	21	11	9
Need a small sign manufactured	-	-	-	5	4	22	47
Broken window glass	2	5	18	17	22	9	5
Need operations board hung on wall	1	2	6	5	18	16	30
Scuttlebutt out of order	2	8	23	15	17	9	6
Guard truck stalls on road	60	18	2	-	-	-	-
Reefer in galley goes out	61	10	5	4	-	-	-
Main road has bad chuck hole	1	4	15	14	25	10	9
Cooking gas odor noticed in quarters	68	9	-	-	-	-	-
Ladies toilet needs cleaning	3	9	24	21	18	3	-
Typewriter needs repairs	2	6	13	11	17	12	17
File cabinet drawer stuck	6	12	26	12	16	1	5
Warehouse door is off track	2	12	41	16	5	2	1
Steam radiator is leaking	10	11	21	19	11	3	3
	299	188	319	224	242	139	149



CEC Tabulation

WHAT IS A REASONABLE CHARGE FOR SERVICES?

For the following list, please indicate what you think is the maximum reasonable charge for performing the service or work indicated. Consider for purposes of similarity that the point of work is not over one mile from the Public Works Facility, and that skilled labor is paid about \$3.00 per hour. Reasonable charge should include basic labor, material, and allowance for overhead.

Service or Work to be Performed

Maximum Reasonable Charge in Dollars

	1	2	4	8	16	32	Over 32
Unstop plugged water closet	1	26	39	14	-	-	-
Replace fluorescent tube in office with 10' ceiling	7	26	36	10	1	-	-
Change a sedan tire on the road	2	23	36	13	2	-	-
Construct and install a 3' x 4' celotex faced bulletin board	-	-	8	23	37	4	4
Replace an electric wall outlet fixture	-	10	32	29	6	1	-
Repaint a metal office desk	-	-	4	13	36	15	9
Replace a 12" x 20" window glass	1	6	41	26	5	-	-
Replace a washer in leaking faucet	17	40	19	1	-	-	-
Install new night latch in wood door	-	9	31	34	4	-	-
Truck crane makes one 2000 lb. lift to flatbed trailer from ground (2-man rig)	-	1	5	19	29	9	13
Clean a 10' x 15' office	6	22	29	15	2	-	2
Mow a lawn, 100' x 200', walking power mower.	-	6	28	34	7	3	-

CEC Tabulation

The following list expresses traits common to most organizations. Please indicate in the column to the right, the importance you would attach to these traits being identified with a Public Works Center or Department.

Trait	Must Have	Desireable	Not Important
Alert	<u>64</u>	<u>16</u>	<u>0</u>
Open-minded	<u>42</u>	<u>31</u>	<u>7</u>
Modern	<u>21</u>	<u>53</u>	<u>7</u>
Progressive	<u>44</u>	<u>36</u>	<u>0</u>
Forward looking	<u>48</u>	<u>31</u>	<u>1</u>
Imaginative	<u>31</u>	<u>46</u>	<u>3</u>
Inventive	<u>25</u>	<u>46</u>	<u>9</u>
Artistic	<u>2</u>	<u>29</u>	<u>49</u>
Lively	<u>22</u>	<u>40</u>	<u>18</u>
Eager	<u>21</u>	<u>46</u>	<u>13</u>
Vigorous	<u>42</u>	<u>36</u>	<u>2</u>
Enterprising	<u>40</u>	<u>36</u>	<u>4</u>
Venturesome	<u>4</u>	<u>29</u>	<u>47</u>
Cheerful	<u>37</u>	<u>40</u>	<u>3</u>
Friendly	<u>34</u>	<u>41</u>	<u>5</u>
Kindly	<u>16</u>	<u>42</u>	<u>22</u>
Warm-hearted	<u>9</u>	<u>27</u>	<u>32</u>
Charitable	<u>2</u>	<u>22</u>	<u>56</u>
Public-spirited	<u>19</u>	<u>38</u>	<u>13</u>
Patriotic	<u>47</u>	<u>30</u>	<u>3</u>
Honest	<u>78</u>	<u>2</u>	<u>0</u>
Reliable	<u>80</u>	<u>0</u>	<u>0</u>
Sincere	<u>63</u>	<u>16</u>	<u>1</u>



Trait	Must Have	Desireable	Not Important
Square dealing	<u>58</u>	<u>21</u>	<u>1</u>
Modest	<u>3</u>	<u>29</u>	<u>38</u>
Homespun	<u>0</u>	<u>4</u>	<u>76</u>
Easygoing	<u>0</u>	<u>9</u>	<u>70</u>
Flexible	<u>57</u>	<u>20</u>	<u>3</u>
Well informed	<u>64</u>	<u>16</u>	<u>0</u>

Of the traits you have indicated as "must have" which three are the most important?

1. Reliable
2. Honest
3. Alert

How many years of Public Works experience have you had? *

* Not entered, although surveys were kept by class of respondents having 0-4.9 years, 5-9.9 years, and over 10 years of service. No appreciable overall difference noted.

APPENDIX III
PUBLIC WORKS CENTER SURVEY

222 CHORDIA

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Typical Public Works Center Letter

2 March 1961

Captain E. R. Bennett, CEC, USN
Commanding Officer
U.S. Naval Public Works Center
U.S. Naval Base
Newport, Rhode Island

Dear Captain Bennett:

I am assigned to the Navy Comptrollership Course at George Washington University for post-graduate management training. As part of the course requirement we must submit a thesis. The tentative title of my thesis is "Organization for Minor Service Functions at Public Works Centers." This subject has been cleared with Commander Cline and Captain Husband. Although the Bureau is allowing me to study the material it has in the area of my thesis, additional information is required from the Public Works Centers themselves. I am fully aware that the demands on your time and the time of your personnel are many. I have made an honest effort to keep the enclosed questionnaires short and simple. Some questions require factual answers, others require opinions. The questionnaires are directed to certain segments of your organization, and are stapled together in sets.

The set of questionnaires marked for the Commanding Officer is submitted for information purposes. These questionnaires have been sent to a random sample of CEC Officers, and to certain customers of the Public Works Centers. These questionnaires were prepared in an attempt to bring definition to three problem areas concerned with customer service: (1) What is reasonably responsive service? (2) What is a reasonable cost for minor services? and (3) What service "image" should the PWCenter create in the mind of its customers? Once the customer's expectations, (reasonable or unreasonable as they may be) are known and can be correlated with the experience of CEC Officers, we may be in a position to determine the shape of the organization needed to best serve the customer.

Except for the FACT sheets, the remainder of the questionnaires can be completed in about fifteen minutes each. This study is not intended to make comparisons between or of individual Public Works Centers. My interest is in Public Works Centers as a management entity, and I have no desire to become an unofficial IG.

Your assistance is respectfully requested. Like most students we are on a tight schedule. This year theses must be submitted six weeks prior to graduation. The return of the completed questionnaires as soon as possible, but not later than the 25th of March will be deeply appreciated.

Very Respectfully,

Charles E. Diehl
LCDR, CEC, USN

though the two boys, the children of the
 generation and the mother in their father's house,
 this story is not enough to make me believe in the
 existence of the mother. It is not enough to make
 me believe in the mother, and I have no doubt in
 my mind as to the mother.

There is a great deal of evidence to show that
 the mother is not a single person, but a group of
 people who are all part of the same family. The mother
 is not a single person, but a group of people who
 are all part of the same family. The mother is not
 a single person, but a group of people who are all
 part of the same family.

Very respectfully,

Thomas A. Smith
 1000 1st St.

P.W. Center Tabulation

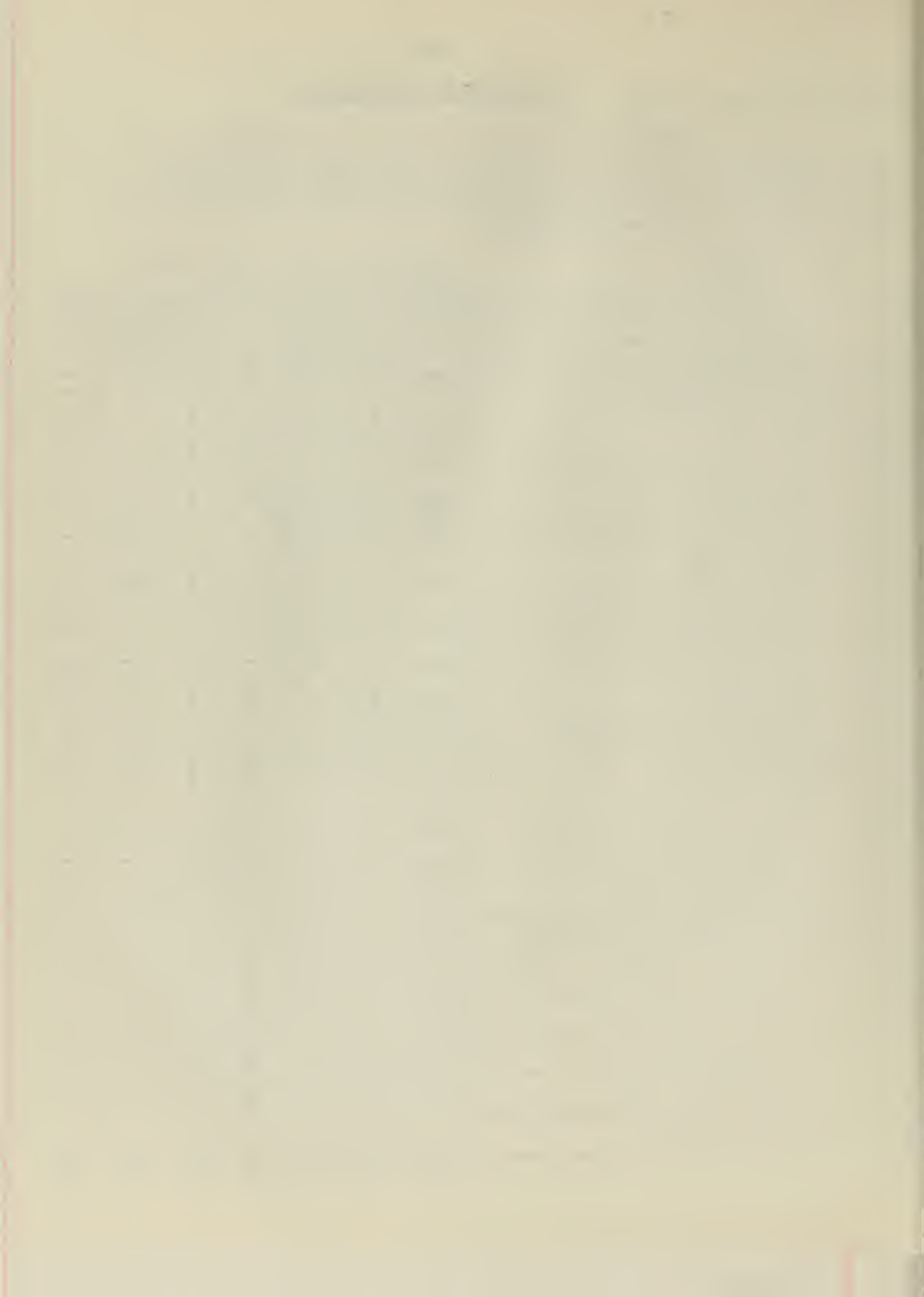
WHAT IS REASONABLE SERVICE?

The following list of minor work items contains some of the most frequent service or trouble-calls received by Public Works organizations. Please check the column that indicates the maximum delay in hours that you consider reasonable under normal conditions, before someone arrives to start work, after a call has been placed.

Type of Service

Maximum Reasonable Delay in Hours
Before Serviceman Arrives

	1	2	4	8	24	48	Over 48
Washbowl Stopped-up	-	4	3	1	2	-	-
Air-conditioner in office is out	1	2	2	1	1	-	-
Window won't open	-	1	1	-	2	3	1
Head is out of paper towels	3	1	3	1	-	-	-
Electric Cord on office machine shorted	1	1	4	-	-	1	-
Shower Head is leaking	-	-	2	3	1	1	1
VIP's coming, grass needs cutting	-	-	1	4	-	2	1
Need a small sign manufactured	-	-	1	-	4	-	3
Broken window glass	-	2	-	4	1	1	-
Need operations board hung on wall	1	-	1	-	2	3	1
Scuttlebutt out of order	-	1	1	4	1	1	-
Guard truck stalls on road	4	4	-	-	-	-	-
Reefer in galley goes out	5	3	-	-	-	-	-
Main road has bad chuck hole	1	-	-	-	3	2	2
Cooking gas odor noticed in quarters	7	-	-	-	-	-	-
Ladies toilet needs cleaning	-	2	1	4	1	-	-
Typewriter needs repairs	-	2	-	2	1	-	2
File cabinet drawer stuck	-	2	5	1	-	-	-
Warehouse door is off track	-	2	2	4	-	-	-
Steam radiator is leaking	-	1	1	-	4	-	-
	23	29	28	29	23	14	11



P.W. Center Tabulation

WHAT IS A REASONABLE CHARGE FOR SERVICES?

For the following list, please indicate what you think is the maximum reasonable charge for performing the service or work indicated. Consider for purposes of similarity that the point of work is not over one mile from the Public Works Facility, and that skilled labor is paid about \$3.00 per hour.

Reasonable charge should include basic labor, material, and allowance for overhead.

Maximum Reasonable Charge in Dollars

Service or Work to be Performed

	1	2	4	8	16	32	Over 32
Unstop plugged water closet	-	1	5	2	-	-	-
Replace fluorescent tube in office with 10' ceiling	-	4	2	2	-	-	-
Change a sedan tire on the road	-	1	5	1	-	-	-
Construct and install a 3' x 4' celotex faced bulletin board	-	-	-	3	5	-	-
Replace an electric wall outlet fixture	-	1	4	3	-	-	-
Repaint a metal office desk	-	-	-	1	6	-	1
Replace a 12" x 20" window glass	-	1	5	2	-	-	-
Replace a washer in leaking faucet	1	4	3	-	-	-	-
Install new night latch in wood door	-	2	1	4	1	-	-
Truck crane makes one 2000 lb. lift to flatbed trailer from ground (2-man rig)	-	-	1	2	5	-	-
Clean a 10' x 15' office	1	2	5	-	-	-	-
Mow a lawn, 100' x 200', walking power mower.	-	1	4	1	1	1	-



P.W. Center Tabulation

The following list expresses traits common to most organizations. Please indicate in the column to the right, the importance you would attach to these traits being identified with a Public Works Center or Department.

Trait	Must Have	Desireable	Not Important
Alert	<u>4</u>	<u>-</u>	<u>-</u>
Open-minded	<u>3</u>	<u>1</u>	<u>-</u>
Modern	<u>4</u>	<u>-</u>	<u>-</u>
Progressive	<u>4</u>	<u>-</u>	<u>-</u>
Forward looking	<u>4</u>	<u>-</u>	<u>-</u>
Imaginative	<u>3</u>	<u>1</u>	<u>-</u>
Inventive	<u>2</u>	<u>2</u>	<u>-</u>
Artistic	<u>1</u>	<u>2</u>	<u>1</u>
Lively	<u>1</u>	<u>3</u>	<u>-</u>
Eager	<u>1</u>	<u>3</u>	<u>-</u>
Vigorous	<u>3</u>	<u>1</u>	<u>-</u>
Enterprising	<u>2</u>	<u>2</u>	<u>-</u>
Venturesome	<u>2</u>	<u>-</u>	<u>2</u>
Cheerful	<u>2</u>	<u>2</u>	<u>-</u>
Friendly	<u>2</u>	<u>2</u>	<u>-</u>
Kindly	<u>2</u>	<u>-</u>	<u>2</u>
Warm-hearted	<u>-</u>	<u>2</u>	<u>2</u>
Charitable	<u>-</u>	<u>2</u>	<u>2</u>
Public-spirited	<u>2</u>	<u>2</u>	<u>-</u>
Patriotic	<u>4</u>	<u>-</u>	<u>-</u>
Honest	<u>4</u>	<u>-</u>	<u>-</u>
Reliable	<u>4</u>	<u>-</u>	<u>-</u>
Sincere	<u>4</u>	<u>-</u>	<u>-</u>
more			



Trait	104	Desireable	Not
	Must Have		Important
Square dealing	<u>4</u>	<u>-</u>	<u>-</u>
Modest	<u>2</u>	<u>2</u>	<u>-</u>
Homespun	<u>-</u>	<u>2</u>	<u>2</u>
Easygoing	<u>-</u>	<u>-</u>	<u>4</u>
Flexible	<u>3</u>	<u>1</u>	<u>-</u>
Well informed	<u>4</u>	<u>-</u>	<u>-</u>

Of the traits you have indicated as "must have" which three are the most important?

1. Not evaluated
2. Not evaluated
3. Not evaluated

How many years of Public Works experience have you had? N. A.

Public Works Center Survey

The information obtained on the Fact Sheets was impossible to correlate for the purpose originally intended, to build a model for analysis. Because it has no bearing or correlation, the responses have not been entered.

THE INDIAN BUREAU OF LANDS

The Department of the Interior has been authorized to acquire lands for the Indian Bureau. It is the policy of the Department to acquire lands for the Indian Bureau in order to provide for the education and training of the Indian children. The Department has been authorized to acquire lands for the Indian Bureau in order to provide for the education and training of the Indian children.

FACT SHEETS

PWCEN 1

The questions on this sheet can be best answered by your planning officer or maintenance control director, depending on your organizational arrangement. Pencil is fine, and approximations are acceptable.

1. How many hours of direct labor are normally applied each day in the following areas?

- a. Janitorial _____
- b. Groundskeeping _____
- c. Minor Job Orders _____
- d. Emergency/Service Work _____

2. How many supervisors are involved in these areas? (First level only)

- a. Janitorial _____
- b. Groundskeeping _____
- c. Minor Job Orders _____
- d. Emergency/Service Work _____

3. Where do the workers in the four minor service functions listed check in or out normally. (If more than one method prevails, indicate percentage)

	Central Shops	Satellite Shops	Assigned Work Area
a. Janitorial	_____	_____	_____
b. Groundskeeping	_____	_____	_____
c. Minor Job Orders	_____	_____	_____
d. Emergency/Service	_____	_____	_____

4. What is your break in hours on-

- a. Minor Job Orders _____ Hrs or less
- b. Emergency/Service Work _____ Hrs or less

5. Do you answer phone requests for non-emergency work?

Yes _____ (If yes checked please provide procedure or instruction)

No _____

6. In answering Emergency/Service work calls what percentage of the times is a skilled journeyman required?

- a. Electricians _____% b. Reefer Mechanic _____%
- c. Plumber _____% c. Carpenter _____%
- d. Painter _____%

FACT SHEETS

PWCEN 1A

7. Do you use General Helpers or a type of Handyman rating in your Emergency/Service shop to answer calls?
Yes _____ No _____ If Yes, what percentage _____
8. Do you have a method of detecting and noting REPEAT calls for the same emergency/service jobs? Yes _____ No _____ For Minor Job Orders? Yes _____ No _____
9. Do you keep a record of these repeat calls? Yes _____ No _____
10. Is the record of repeat calls reviewed? Yes _____ No _____
If Yes, by whom _____
how often _____
11. How many days backlog of work do you normally have in
Minor Job Orders _____
Emergency/Service Work _____
12. What is the average age of your active, but not worked on
Minor Job Orders _____ Days
Emergency/Service
Work Orders _____ Hours
14. Have you taken advantage of fixed price work? Yes _____ No _____
If the answer is yes, please attach copies of your instructions or procedures, and samples of the kind of work covered.
15. Please complete the attached questionnaire on reasonable charges for service. A "ballfield" estimate is necessary in view of the limited information, however seldom would more information be provided if the request were made by telephone.
16. Have you developed for management purposes a map showing the concentration of workload by areas? Yes _____ No _____
If the answer is yes, would you please furnish a copy to me?

FACT SHEET

PWCEN 2

The questions on this sheet can be best answered by your operations officer. Pencil is fine, and approximations are adequate.

1. What mode of travel is used by your Emergency/Service shop personnel? (Please indicate by percentage)

Trucks assigned-

Radio controlled _____%

Non-radio _____%

Pool Vehicles

Taxi type _____%

Self-driven _____%

Bus Service

Station _____%

Shops operated _____%

Bicycle/Scooter _____%

Walking _____%

2. How many hours a day does your supervisor at the leadingman level have contact with his employees, their work, and work methods?

Shop	Actual overseeing	_____	hrs/employee/day		
Overall	Work inspection	_____	hrs	"	"
Janitorial	Actual overseeing	_____	hrs	"	"
	Work inspection	_____	hrs	"	"
Groundskeeping	Act. overseeing	_____	hrs	"	"
	Work inspection	_____	hrs	"	"
Emergency/Serv.	Act. overseeing	_____	hrs	"	"
	Work inspection	_____	hrs	"	"

3. Do you schedule all specific job orders and standing job orders? Yes _____ No _____ Partial _____% of total hours

4. Are minor job orders scheduled? Yes _____ No _____ (if yes, Weekly _____ Daily _____ As fill in _____ when?)

5. In your opinion rank by number (1 thru 4) the following maintenance areas as to difficulty in pleasing customer.

Specific Job Orders _____
 Standing Job Orders _____
 Minor Job Orders _____
 Emergency/Service Orders _____

Page 1

Page 1

The Government of the State of New York is hereby notified that the following is a list of the names of the persons who have been appointed to the various offices of the State of New York for the year 1911.

1. The following is a list of the names of the persons who have been appointed to the various offices of the State of New York for the year 1911.

1.	John A. ...
2.	John A. ...
3.	John A. ...
4.	John A. ...
5.	John A. ...
6.	John A. ...
7.	John A. ...
8.	John A. ...
9.	John A. ...
10.	John A. ...

2. The following is a list of the names of the persons who have been appointed to the various offices of the State of New York for the year 1911.

1.	John A. ...	John A. ...
2.	John A. ...	John A. ...
3.	John A. ...	John A. ...
4.	John A. ...	John A. ...
5.	John A. ...	John A. ...
6.	John A. ...	John A. ...
7.	John A. ...	John A. ...
8.	John A. ...	John A. ...
9.	John A. ...	John A. ...
10.	John A. ...	John A. ...

3. The following is a list of the names of the persons who have been appointed to the various offices of the State of New York for the year 1911.

4. The following is a list of the names of the persons who have been appointed to the various offices of the State of New York for the year 1911.

5. The following is a list of the names of the persons who have been appointed to the various offices of the State of New York for the year 1911.

1.	John A. ...
2.	John A. ...
3.	John A. ...
4.	John A. ...
5.	John A. ...

6. Please complete the attached questionnaire on reasonable service delays. This again calls for your opinion, operating under normal conditions.
7. Do you have a policy on the handling of Emergency/Service Work? Yes _____ No _____
If it is written please provide a copy.

2. These conditions are intended to ensure that the
 parties to the contract are fully aware of the
 terms and conditions of the contract.

3. It is the intention of the parties that the contract
 shall be binding on the parties and their
 heirs and assigns forever.

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APPENDIX

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